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An analysis of performance at the basic school as a predictor of officer performance in the operating forces

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THESIS

AN ANALYSIS OF PERFORMANCE AT THE BASIC SCHOOL AS A PREDICTOR OF OFFICER PERFORMANCE IN THE OPERATING FORCES

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March 2008

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13. ABSTRACT (maximum 200 words)

The purpose of this thesis is to identify and assess factors that predict the performance of junior officers in the operating forces of the U.S. Marine Corps. In this analysis, fitness report scores are used as indicators of performance. We concentrate on the effect of performance at The Basic School (TBS) and other demographic characteristics on fitness report scores. The data used in this analysis includes information on all officers who were newly commissioned between 1998 and 2005, TBS performance data for these same cohorts, and fitness report data for TBS graduates.

The results of this analysis find that several factors predict officer performance as indicated by fitness report scores. All aspects of TBS performance are important in predicting future success. However, we find that leadership scores at TBS have the strongest impact on performance in the operating forces. Also, officers who are prior enlisted, married, or female have higher fitness report scores, whereas blacks have lower scores. We also find that officers who finish TBS in the top third of their TBS company receive higher average fitness report scores than officers who finish in the middle third; conversely, officers in the bottom third of their TBS class receive lower fitness report scores than those in the middle third. Lastly, we find that whether officers receive their preferred MOS assignment has little effect on their performance as a junior officer.

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AN ANALYSIS OF PERFORMANCE AT THE BASIC SCHOOL AS A PREDICTOR OF OFFICER PERFORMANCE IN THE OPERATING FORCES

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I. INTRODUCTION

A. BACKGROUND

All officer candidates entering the Marine Corps do not attend Officer Candidate School (OCS), and those officers who do attend don't necessarily go through the same program. However, every newly commissioned officer attends The Basic School (TBS) in Quantico, VA. While at TBS each newly commissioned officer goes through the rigorous six-month training course called the Basic Officer's Course (BOC). This course exemplifies the motto, "Every Marine a Rifleman," as it provides every officer with skills and experiences common to all Marines including both officers and enlisted personnel. This course also reinforces core officer competencies including leadership, officership, responsibility, accountability, field craft, decision making, problem solving, and warrior ethos. Furthermore, the BOC prepares officers for follow-on training at their military occupational specialty (MOS) schools and subsequent assignment to a company grade officer billet in the operating forces. The stated mission of The Basic School is:

> Train and educate newly commissioned or appointed officers in the high standards of professional knowledge, esprit-de-corps, and leadership required to prepare them for duty as company grade officers in the operating forces, with particular emphasis on the duties, responsibilities and warfighting skills required of a rifle platoon commander. (TBS website 2007)

While attending TBS, officers undergo hundreds of hours of instruction both in the classroom and in the "field." Upon completion of various periods of instruction, officers are required to take written examinations and practical application examinations, and also to apply what they've learned during training exercises in a tactical field environment.

An officer student's overall grade is a composite of three "weighted and graded" areas of evaluation. These areas of evaluation are Leadership, Academics, and Military Skills. The officers of each company are then ranked, in lineal order, from highest

overall grade to lowest overall grade. The overall grades are the basis on which officers with the same commissioning date are then assigned lineal numbers. An officer's lineal number will determine when he or she is promoted in relation to other officers with the same commissioning date that have been selected for promotion.

According to the Marine Corps Promotion Manual, a promotion is "not considered a reward for past performance but as an incentive to reach the next higher grade." Factors such as potential (based on past performance), appearance, professional military education, experience, Title 10 requirements, and vacancies all help to determine if an officer is qualified and will be promoted. However, an officer's performance at TBS, as indicated by his or her lineal standing, is the factor that determines when an officer is promoted to the selected grade. An officer with a lower lineal number will be promoted prior to an officer with a higher lineal number. Since it typically takes an entire fiscal year to promote all officers selected for promotion, this spread in lineal numbers can mean a large differential in promotion times for individuals sharing the same date of commission.

This system creates an interesting situation when one considers that performance at The Basic School may not be necessarily predictive of performance in the Operating Forces. An officer who performed marginally at The Basic School but has consistently out-performed his or her peers in the operating forces will likely always lag behind an officer who performed exceptionally at TBS but performed only marginally in the fleet, assuming these officers share the same commissioning date. Since performance at TBS plays such an influential role in the promotion system, especially early in an officers' career, it is imperative that the Marine Corps make an informed decision regarding the evaluation system being used at The Basic School to rank officers.

Further, an analysis of the correlation between performance at TBS and performance in the operating forces will provide information as to the effectiveness of the MOS assignment process currently in use at The Basic School, known as the "Quality Spread." The Quality Spread is the process by which ground assignable students are divided into thirds based on their respective company lineal standing, at a certain point in the Program of Instruction. HQ, USMC (Manpower and Reserve Affairs) will then

provide each BOC company a distribution of ground assignable MOSs, which will then be equally (to the greatest extent possible) divided into thirds also. Students are then assigned an MOS based on their preferences, and MOS availability in each “third.” This process is accomplished using an optimization program called “My MOS."

B. PURPOSE

The purpose of this thesis is to analyze the correlation between the performance of officers at TBS and their performance in the operating forces. This work includes an analysis of fitness reports for all newly commissioned officers post-1998 when changes to the Performance Evaluation System went into effect. This thesis will also analyze the three areas in which students are evaluated at TBS to determine which, if any, of these three areas are most predictive of future performance in the Operating Forces.

C. RESEARCH QUESTIONS

1. The Primary Research Question

What is the relationship between the weighted/graded areas at The Basic School (Leadership, Academics, Military Skills) and "success" in the operating forces as measured by fitness report scores?

2. The Secondary Research Questions

What is the relationship between the student's final lineal standing at TBS and his/her success in the operating forces?

Are individuals with certain background characteristics predisposed to being more successful in the operating forces?

Is the Quality Spread the most effective tool for assigning MOSs from The Basic School?

Is the Staff Platoon Commander doing an adequate job of evaluating student officers?

D. BENEFITS OF THE STUDY

This study will provide the Marine Corps with the statistical basis from which to analyze its current evaluation process at The Basic School. It will also provide the basis from which to determine if the current officer MOS assignment process (the Quality Spread) is effective, or even necessary. It will also provide insight as to whether or not the leadership evaluation process used by Staff Platoon Commanders is accurate and in consonance with the officer's future performance in the Operating Forces.

E. SCOPE AND METHODOLOGY

This thesis analyzes the relationship between officers' performance at TBS and their performance in the Operating Forces, using data on Marine Corps officers commissioned from 1998-2005. The study will include a reexamination of The Basic School's grading breakdown/criteria, quality spread/MOS assignment system, selection and assignment to Staff Platoon Commander (SPC), and the Marine Corps performance evaluation system.

F. ORGANIZATION OF THE STUDY

This study is organized into seven chapters. Chapter II will provide an overview of TBS and the Marine Corps officer performance evaluation system. In Chapter III we will review literature from previous studies on Marine officer performance, and on the relationship between PMOS and promotion, and on the MOS assignment process. Chapter IV provides a preliminary analysis and discussion of data used for the statistical analysis (drawn from TBS, MMEA, and the Center for Naval Analyses). Chapter V discusses the research methodology and estimating, models and the statistical results. Chapter VI concludes by summarizing the conclusions and offering recommendations based on the statistical results.

II. AN OVERVIEW OF THE BASIC SCHOOL, THE MARINE CORPS PROMOTION SYSTEM, AND THE MARINE CORPS PERFORMANCE EVALUATION SYSTEM

This chapter describes TBS, the Marine Corps' officer promotion system, the Marine Corps' Performance Evaluation System (PES), and the various Marine Corps commissioning programs. The Basic School is a post-commissioning training program that is unique to the military. All officers entering any of the four services are required to attend Basic School, and they receive the same post-commissioning training, regardless of their military occupational specialty (MOS).

A. COMMISSIONING PROGRAMS

There are seven different commissioning programs for Marine Corps officers: Naval Reserve Officer Training Course (NROTC), United States Naval Academy (USNA), Platoon Leader Course (PLC), Marine Corps Enlisted Commissioning Program (MECEP), Officer Candidate Course (OCC), Enlisted Commissioning Program (ECP), and the Meritorious Commissioning Program (MCP). Each program differs in length, number of candidates, entrance requirements, and depth of exposure to Marine Corps officer culture. Ergun (2003) and Finley (2002) provide detailed explanations of each program in their thesis. We will discuss the major features of each program.

1. Naval Reserve Officer Training Course

The NROTC Marine option program is open to U.S. citizens, ages 17 to 23,[1] who possess a high school diploma or General Education Development (GED), and have a qualifying score of 1000 on the Scholastic Aptitude Test (SAT) or 22 on the American College Test (ACT). A maximum percentage of 16 2/3 of all NROTC graduates can

[1]Applicants must not have reached their 27th birthday by June 30th of the year in which college graduation and commissioning are anticipated. Applicants who have prior active duty military service may be eligible for age adjustments for the amount of time equal to their prior service, on a month-for-month basis, for a maximum of 36 months, provided they do not reach their 30th birthday by June 30th of the year in which graduation and commissioning are anticipated. (https://www.marines.usmc.mil/G3/Officer/nrotcrequirement.htm, 22 March 2008).

select the Marine option. The NROTC program offers both scholarship and non-scholarship opportunities at more than 150 colleges and universities throughout the United States. Scholarship students receive full tuition and fees, a book stipend, uniforms, and a monthly allowance. Upon commissioning, they incur an eight-year service obligation, in which four years must be served on active duty. Non-scholarship students receive uniforms and a stipend during their last two years of college. Much like the scholarship students, they incur an eight-year service obligation; however, they are only required to serve 3½ years on active duty.

Along with their normal academic workload, NROTC midshipmen attend naval science classes that familiarize them with various aspects of military culture. Throughout the year midshipmen attend training events with their NROTC unit and the Marine Corps operational forces. Lastly, these midshipmen attend "Bulldog" – a six-week course at OCS that screens and evaluates Marine Corps officer candidates.

2. United States Naval Academy

The Naval Academy is the undergraduate university of the naval service. It focuses on providing midshipmen the academic and professional training needed to be successful naval and marine officers. The Naval Academy is open to all single, United States citizens, ages 17 to 23, who are not pregnant, and have no dependents. USNA is highly selective; each year approximately 10,000 applicants seek admission into USNA and, of those, only about 1,200 are accepted.

Life as a midshipman at the Naval Academy is rigorous. Students undergo tightly structured academic education and military training. Life at the Naval Academy starts with a seven-week indoctrination program. At the end of each academic year midshipmen attend various training programs designed to increase proficiency in military skills, leadership abilities, and experience. Up to 20 percent of each graduating class from the Naval Academy can select the Marine Corps option. USNA graduates have a minimum service obligation of five years of active duty and three years in reserve status.

3. Platoon Leader Course

The PLC program is open to all full-time college freshmen, sophomores, or juniors attending an accredited college or university. Students must be U.S. citizens, have a least a 2.0 GPA, and a minimum qualifying score on one of the following tests: 1000 SAT score, 45 ACT score, or 74 QT score on the Armed Service Vocational Aptitude Battery (ASVAB). The program is designed to allow students to join the Marine Corps without interrupting their academic study.

Students who enroll during their freshman or sophomore year attend two six-week OCS sessions while student who enroll during their junior year attend one ten-week session. Those enrolled in the PLC program are not required to serve on active duty until they graduate. Once they graduate, they must fulfill eight years of service, at least three years of which should be on active duty.

4. Marine Corps Enlisted Commissioning Program

MECEP is open to all personnel of the regular Marine Corps, who are U.S. citizens, ages 20 to 26, in the grade of corporal or above. Those applying must have graduated in the top 50 percent of their high school class or, if non-high school graduates, have at least 3 years of high school and a score of at least 75 percent in each area of the GED. Applicants must also have a minimum SAT score of 1000 or an EL score of 115 or greater. MECEP is designed to give qualifying enlisted Marines the opportunity to become officers. Marines accepted into the program attend a college or university with an NROTC unit as a full time student. These marines receive full pay and benefits while in the program and remain eligible for promotion. Unlike midshipmen, MECEP students must pay for tuition, books, fees, housing, and living expenses. MECEP students attend training events with their NROTC unit and also attend the six-week "Bulldog" program at OCS after their first year of school. Upon acceptance into the program MECEP students must reenlist for six years. Once they graduate and are commissioned they incur a four-year service obligation.

5. Officer Candidate Course

OCC is designed to provide college seniors and those with college degrees the opportunity to become Marine Corps officers. The eligibility requirements are similar to the PLC program. Individuals accepted into the program attend a ten-week OCS course and upon completion of this course receive a commission as a second lieutenant in the Marine Corps.

6. Enlisted Commissioning Program

ECP provides active duty and active reserve Marines who possess a four-year degree the opportunity to become commissioned officers in the Marine Corps. Once accepted to the program, Marines are sent to the ten-week training course at OCS. Upon graduation they are commissioned as second lieutenants in the Marine Corps.

7. Meritorious Commissioning Program

MCP allows exceptionally qualified Marines who do not posses a bachelor's degree the opportunity to become officers. Candidates are nominated by their commanding officer and must be approved by a selection board. To be eligible for the program Marines must have at least 75 hours of college work or an associate's degree. Once selected, Marines attend the ten-week Officer Candidate Course at OCS. Once they graduate, they are commissioned as second lieutenants. Officers in this program must complete their bachelor's degree before the end of their obligated service to remain eligible for future promotion.

B. THE BASIC SCHOOL

Once commissioned, all officers attend TBS at Quantico, Virginia. While at TBS, officers attend The Basic Officer Course (BOC), which is an intensive 26-week program of instruction where officers are schooled in five main areas: leadership, military skills, decision making and problem solving, and an introduction to the study of military history and warrior ethos. The mission of TBS is:

> Train and educate newly commissioned or appointed officers in the high standards of professional knowledge, esprit-de-corps, and leadership required to prepare them for duty as company grade officers in the operating forces, with particular emphasis on the duties, responsibilities and warfighting skills required of a rifle platoon commander. (TBS Command Brief, www.tecom.usmc.mil/tbs, 17 January 2008)

By the time an officer graduates the BOC, the staff at TBS expects to have a "Marine officer who is: A man or woman of exemplary character, devoted to leading Marines twenty-four/seven, able to decide communicate and act, a warfighter, mentally and physically tough." (TBS Command Brief, www.tecom.usmc.mil/tbs, 17 January 2008)

TBS has eight companies, six of which are dedicated to training newly commissioned officers. Each company trains approximately 200 officers each year, and there is a two-month gap between the start of each company's training cycle. Each company has a Commanding Officer, Executive Officer, Company Gunnery Sergeant, and six Staff Platoon Commanders (SPC), one for each of the six platoons. The Commanding Officer of each company is typically a major and reports to the commanding officer of TBS, who is typically a colonel. Along with the student companies, there is an Instructor Battalion that consists of several companies dedicated to supporting the training and education of the officers in the Basic Officer Course. Instructor Battalion also provides the Marines and equipment to logistically support the training in the BOCs.

The BOC uses several phases to teach topics to students. Each phase builds upon the last phase to ensure officers receive thorough information, have ample time to study a topic, and receive various points of view from different instructors. Lessons begin in a classroom environment, then move to a sand table, hands on exercises, and/or small group discussion, and typically culminate with a field exercise. There are a total of 1585 training hours. Sixty percent of training time, or 933 hours, are spent in the classroom, and 40% of training time, or 652 hours, is spent in the "field" (TBS Command Brief, www.tecom.usmc.mil/tbs, 17 Jan 2008).

Instruction at TBS is focused on three main areas: maneuver warfare theory and practice, tactics, techniques and procedures, and officership. Officership includes ethics, human factors of leadership, communication and decision-making, mental and physical toughness as well as bias for action training. The period of instruction is, "infantry centric…combat oriented, and reflects timeless infantry skills and [the] current combat environment." (TBS command Brief, www.tecom.usmc.mil/tbs, 17 Jan 2008)

Instruction is also broken down into four phases that build upon one another. Phase one is seven weeks in length and lays the foundation for students by developing individual skills. Phase two, rifle squad leadership skills, is six weeks. This phase moves from inward development to leadership and employment of a squad size element. Phase three, rifle platoon commander skills, is six weeks long and focuses on developing an officer's ability to command a platoon, which is the size of unit a lieutenant will normally lead after graduating from TBS and his follow-on MOS school. Phase four is seven weeks long and provides instruction on basic Marine Air Ground Task Force (MAGTF) officer skills.

Students are evaluated on their ability and skill in three main areas: military skills, academics, and leadership. Military skills make up 32 percent of a student's grade and include physical training events, such as the endurance and double-obstacle courses, tactical decision making exams, weapons qualification, and practical application exams. Academics account for 32 percent of a student's final grade. A student's academic score is comprised of his or her score on ten cumulative written examinations that cover topics from amphibious operations to writing skills. The last graded area, leadership, comprises 36 percent of a student's grade. Students are evaluated throughout their time in the BOC; they receive two command leadership evaluations, numerous garrison and tactical billet evaluations, and several peer evaluations. The first leadership evaluation accounts for 14% of the student's overall grade. The second leadership evaluation accounts for 22% of the overall grade. The Staff Platoon Commander assigns 90% of the leadership grade by ranking the officers in his platoon from first to last. An officer's fellow students account for the remaining 10% of the leadership grade by completing "Peer Evaluations." For the first leadership evaluation, Peer Evaluations are completed by officers of the

same squad. For second leadership evaluation, Peer Evaluations are completed by all the officers of the platoon. For example, if Second Lieutenant Jones is in first squad, and there are 12 other officers in that squad, the other 12 officers will complete peer evaluations of Second Lieutenant Jones for first leadership evaluation. The officer does not complete a peer evaluation of himself.

At the time of MOS assignment, there are only a certain number of weighted and graded events that are completed. Notably, First Leadership Evaluation is completed, but Second Leadership Evaluation is not. The number of events that are completed is not necessarily the same for each BOC company. A lineal standing of the students is created based on the events that are completed and entered into the system. In order to ensure there are quality officers throughout the entire MOS spectrum, the class is divided into thirds (top, middle, bottom) and vacancies in available MOSs are distributed among each third. The Marine Corps refers to this process as "The Quality Spread." Officers can only compete for vacancies in MOSs that are available in their third. For example, suppose an officer in the top third selects an MOS as his top choice, but the five vacancies for that MOS in that third are already distributed; therefore, the officer is assigned the next highest MOS on his list that is still available. TBS currently uses an optimization program, called MY MOS, to accomplish the task of matching ground assignable officers to an MOS preference so that the company can achieve the highest percent of officers assigned to a top 5 MOS preference as possible.

At the conclusion of the BOC officers have earned a GPA based on their performance in the three graded areas. Students are then ordered and assigned a final TBS class rank based on their overall GPA. A student's final class standing will have a significant and lasting impact on their career. Headquarters Marine Corps assigns a precedence number to all Marines graduating from TBS based on their date of rank[2] and

[2] Second lieutenants commissioned between 1 May and 30 June of each year have a date of rank of first commission the same as that for the U.S. Naval Academy graduating class for that year.

their final class standing.[3] This lineal number affects an officer's seniority, which in turn impacts eligibility for promotion, "Initial assignment and maintenance of lineal precedence affects each officer's seniority, provides the sole basis for determining an officer's eligibility for promotion, and drives the timing of the officer's promotion once selected" (MCBUL 1400, July 07). Since the officer's lineal precedence depends solely on his/her performance at The Basic School (among officers with the same date of commission), we assume that TBS performance will have a lasting impact on an officer's career.

C. MARINE CORPS OFFICER PROMOTION SYSTEM

In order to remain in service it is necessary that an officer continue to be promoted throughout his or her career. Defense Officer Personnel Management Act of 1980 (DOPMA) established and regulates promotion flow points throughout the armed forces. The Marine Corps officer flow points are well established and fall within DOPMA's regulations. Figure 1shows typical promotion flow points for Marine Corps officers for grades O-3 through O-6.

[3] "Precedence numbers are assigned to all second lieutenants, including graduates of a service academy, according to the order of their overall class average (expressed to the nearest thousandth of a percent) at The Basic School. In the event of a tie, officers are ranked among themselves according to their class average in leadership at The Basic School." (MCO P1400.31C, Aug 2006).

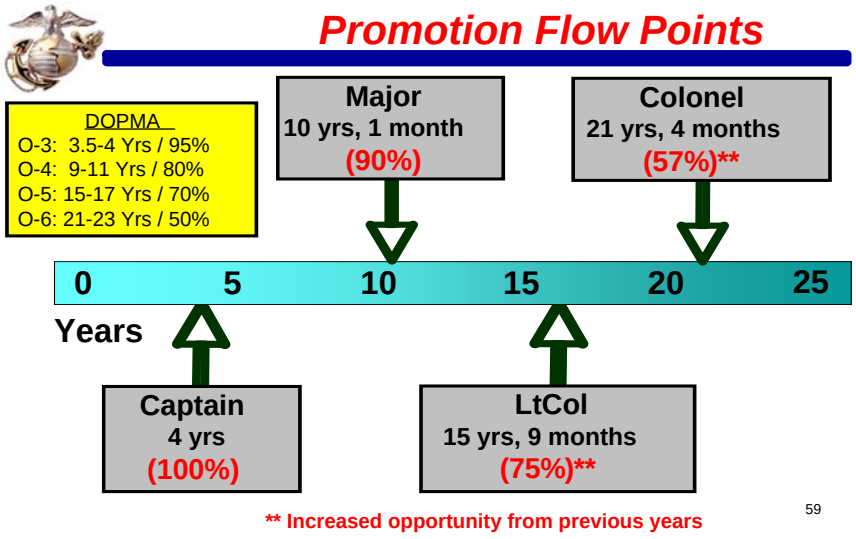

Figure 1. .Marine Corps Officer Promotion Flow Points

(Source: From HQMC MMOA FY-08 Road Show Brief 2007)

Unlike the Marine Corps enlisted promotion system, the officer promotion system does not promote based on PMOS. Instead, officers are promoted based on who is believed to be the best and most fully qualified. According to the Marine Corps Promotions Manual,

> Officers are selected for promotion for their potential to carry out the duties and responsibilities of the next higher grade based upon past performance as indicated in their official military personnel file. Promotions should not be considered a reward for past performance, but as incentive to excel in the next higher grade.

While many officers may possess the potential to perform in the next higher grade, it is necessary that a vacancy exist in order to promote an officer. Even still, the Marine Corps promotion system is based on law. Regulations are set that determine the conduct, scope, and timing of promotions. These regulations exist in Title 10, DOPMA, Marine Corps Order P1400.31.C, and various other SECNAV instructions, and Marine Corps bulletins, directives, and messages. Grade tables in Title 10 specifically outline the number of officers authorized, major through colonel, in each service at the end of the

fiscal year.[4] Table 1 shows the maximum number of majors, lieutenant colonels, and colonels that may be serving on active duty at the end of the fiscal year.

Table 1. DOPMA officer strength and distribution in grade

Marine Corps Officer	Major	Lieutenant Colonel	Colonel
10,000	2,525	1,480	571
12,500	2,900	1,600	632
15,000	3,275	1,720	653
17,500	3,650	1,840	673
20,000	4,025	1,960	694
22,500	4,400	2,080	715
25,000	4,775	2,200	735

(Source: Title 10, Armed Forces Section Jan 8, 2004)

The Marine Corps officer promotion process can be separated in to three time frames: pre-board, during board, and post-board processes. During each time frame, specific activities take place such as publishing directives and messages, establishing promotion zones, setting criteria for promotion, selecting officers for promotion, and releasing promotion board results.

During the pre-board process, the Marine Corps Manpower Plans and Policy Division (MPP) develops the promotion plan that is used to determine eligibility, zone sizes, and selection opportunities for promotion. According to the Marine Corps promotion manual (MCO P1400.31B, 2006), there are five factors taken into consideration in developing the promotion plan:

> (a) The number of requirements needed to meet the projected vacancies by grade.
>
> (b) The estimated number of officers needed to fill vacancies during the period in which it is anticipated that the officers selected for promotion will be promoted and the number of officers authorized by Secretary of the Navy to serve in the grade and competitive category under consideration.

[4] The number of officers who may be serving on active duty in each of the grades of major, lieutenant colonel, and colonel may not, as of the end of such fiscal year, exceed a number determined in accordance with table 1 (Title 10, Subtitle A, Part II, Chapter 32, Sec. 523 February 14 2008).

(c) The impact of zone size and promotion opportunity on time-in-service promotion flow points to the next higher grade.

(d) Critically short MOSs requiring skill guidance in the precept.

(e) The forecasted attrition data based on an estimated loss projection by grade, to meet a specified target determined two fiscal years out.

The precept is released from the Secretary of the Navy and provides specific instruction to the promotion board. In particular, the precept provides guidance that the Secretary of the Navy deems important and appoints members to the selection board. Important information may include lists, such as critically short PMOSs, or it may contain a directive for board members. Figure 2 is an example of a typical Marine Corps officer promotion board precept.

Board Precept (Promotion and CSB)

Non-Traditional Billets

The War on Terrorism has seen the growth of billets traditionally not filled by Marine Officers. Officers assigned to nation building and crisis operations billets are critical to the success of our Country's policies. The board should be especially diligent in weighing the qualifications of officers serving in Transition Teams (TT) and Joint Individual Augment (IA) billets. **Service in these critical billets should weigh equal to traditional Marine Corps officer billets in the operational forces supporting the Global War on Terrorism during board deliberations.** [65]

Figure 2. Example Marine Corps Officer Promotion Board Precept
(Source: From HQMC MMOA FY-08 Road Show Brief 2007)

This message instructs board members to look beyond what billets they believe Marine officers should have worked in and instead look at what billets are important to the Marine Corps during the global war on terrorism and treat those billets with as much importance as traditional Marine Corps officer billets.

Title 10 mandates that the Commandant of the Marine Corps provide written notification to eligible officers no less than 30 days prior to the convening of the promotion board. The Marine Corps normally does this through the Manpower Personnel Management (MMPR) branch, which sends out a naval message (MARADMIN) with various information including: convening date of the board, name and date of rank of the senior and junior officer in the in-zone population, and the name and date of the junior officer in the below-zone. Lastly, officers eligible for promotion have an opportunity to communicate with the board on matters affecting promotion; this is normally clarifying information or providing information that may be missing from an officer's record.

Once the board has adjourned, it is responsible for preparing a board report. This report contains a list of all selectees, a statistical analysis, precept, a list of officers eligible for promotion, notice of convening, promotion plan, and sampling of records.[5] Title 10 mandates that no member of the board or recorder of a board are authorized to disclose the board's proceedings, and that no board information is to be released unless authorized by either the Secretary of the Navy, Secretary of Defense, or the President of the United States.[6] Along with the board report, the president of the board must submit a letter that outlines the basis for the board's findings.

After the board report has been signed and the nomination package has been prepared,[7] it is forwarded for endorsement by the Commandant of the Marine Corps (CMC), the Office of the Judge advocate General of the Navy, and the Secretary of the

[5] Promotions Manual MCO P1400.31C.

[6] Promotions Manual MCO P1400.31C.

[7] Senate confirmation is required for all officers on active duty selected for promotion to the grades of major or above, the CMC (MMPR) prepares a nomination package for all boards requiring Presidential and Senate approval. (Promotion Manual MCO P1400.31C, 4006).

Navy. According to the promotions manual, an advanced notification system was created by the CMC to "reduce the insensitiveness of notification through message traffic." The advanced notification system gives general officers and SESs the opportunity to personally notify officers not selected for promotion. Lastly, once time has passed for personal notification, the CMC, after coordination with the Secretary of the Navy, will release a public message (ALNAV) containing the list of officers selected for promotion.

D. PERFORMANCE EVALUATION SYSTEM

The Marine Corps Performance Evaluation System (PES) is a tool to provide every Marine officer and the Marine Corps information regarding an individual's performance, as well as periodic reporting and recording of that performance. The written evaluation, called the fitness report or "fitrep" is the principal method for evaluating a Marine's performance. According to Marine Corps Order 1610.7F, the Commandant's guidance for the PES is:

> The completed fitness report is the most important information component in manpower management. It is the primary means of evaluating a Marine's performance. The fitness report is the Commandant's primary tool available for the selection of personnel for promotion, retention, augmentation, resident schooling, command, and duty assignments. Therefore, the completion of this report is one of an officer's most critical responsibilities. Inherent in this duty is the commitment of each reporting senior and reviewing officer to ensure the integrity of the system by close attention to accurate marking and timely reporting. Every officer serves a role in the scrupulous maintenance of this evaluation system, ultimately important to both the individual and the Marine Corps. Inflationary markings only serve to dilute the actual value of each report, rendering the fitness report ineffective. Reviewing officials will not concur with inflated reports.

The current PES, used since 1999, was implemented to correct problems with the old system, which was replete with unrealistic and inflated markings. The Commandant, as stated above, has reiterated the importance of keeping the system free of inaccurate markings and the significance the fitness report plays throughout a Marine's career.

The Marine Corps Performance Evaluation System provides detailed instructions regarding requirements for the submission of fitness reports. The system has been designed to provide thorough and accurate reports while minimizing any situation in which a Marine has two reporting seniors (RS). The PES also ensures Marines receive a relevant evaluation for every primary billet they hold, and that there are no lapses in evaluating a Marine at any time from the rank of sergeant through major general. These Marines are required to receive fitness reports for any of the 13 occasions that occur:

Occasion Requiring Fitness Reports[8]

Grade Change
CMC Directed
Change of Reporting Senior
Transfer
Change of Duty
To Temporary Duty
From Temporary Duty
End of Service
Change in Status
Annual (Active Component)
Annual (Reserve Component)
Semiannual (lieutenants only)
Reserve Training

Along with following required reporting occasions, RSs can submit non-observed fitness reports if the reporting period is 89 days or less or the RS has insufficient observation time. Reporting Seniors are required to observe the Marine they are reporting on for a minimum amount of time. Reporting Seniors are required to submit reports if the reporting occasion period is longer than 90 days. They must submit reports for periods 31 days or longer if the reporting occasion is either semiannual, temporary duty, or change in status.

[8] When more than one occasion occurs simultaneously, use the occasion that appears highest on the list. (MCO 1610.7F, 2006, p. 3-4).

An RS is the first person in a Marine's chain of command. This is normally a commissioned officer, but the RS can also be a civilian, warrant officer, or, in rare circumstances, a staff noncommissioned officer. The RS plays an integral role in the effectiveness of the PES, the relevance of the fitness report, and the success of the Marine being reported on (MRO). The PES states that, "The RS must establish and clearly convey duties and responsibilities to the MRO and observe, evaluate, and accurately report on the Marine's performance, professional qualities, and potential." "Inherent in this duty is the commitment of the RS to preserve the integrity of the PES by having the moral courage to report with the utmost accuracy." (MCO1610.7F, 2006, p. 2-3) Furthermore, the RS is responsible for forwarding fitness reports to the Reviewing Officer (RO) and counseling the MRO throughout the period covered.

The Reviewing Officer (RO) is similar to the RS. The RO is normally the first person in the RS's chain of command, and he or she is responsible for tasking, supervising, and evaluating the RS. Reviewing Officers are vital in that they provide experience and leadership to RSs. They ensure the RS is adhering to Marine Corps policy regarding the PES and are fulfilling their requirements as an RS.

Appendix A. contains a copy of the fitness report form. Fitness reports have five pages with a total of 12 sections (A through L). Section A provides descriptive information about the MRO that includes name, grade, date of rank, PMOS, height, weight, PFT, and rifle and pistol score. Section A also includes information regarding the organization and unit, occasion of report and the period it covers, duty preference of the MRO, recommendation for promotion, and identifies the RS and RO.

Section B, billet description, illustrates what the MRO was required to do in their billet during the reporting period. This section is the foundation for the evaluation. Section C, billet accomplishments, highlights key accomplishments during the reporting period. Normally this section is completed by the MRO via an "MRO worksheet" and reviewed by the RS prior to completing the report.

Sections D through H evaluate 14 traits the Marine Corps believes, defines a Marine and records how well the Marine fulfills his duties and responsibilities. These

traits are divided in to five sections: mission accomplishment, individual character, leadership, intellect and wisdom, and fulfillment of evaluation responsibilities. Marines are evaluated on each trait. The RS selects one of the markings (A through H) that best fit how the MRO performed, fulfilled, or embodied that trait during the reporting period. An "A" is the lowest marking and "G" is the highest.[9] If an MRO receives an "A" marking in any category regardless of how the rest of the report is marked, the report is adverse. Both "A" and "G" markings are rare and require substantial rationale and justification.

The manner in which these blocks are marked creates a fitness report average. According to the PES manual, "each block in the marking gradient for each PARS has an assigned numeric value as follows: A=1, B=2, C=3, D=4, E=5, F=6, and G=7. Block H does not factor into the calculation of the average. The average of the observed attributes reflects the mean of the numeric value for all observed attributes on that report." (MCO1610.7F, 2006, G-1) The fitness report average allows the Marine Corps to calculate, among other things, the RS's average of all fitness reports written on Marines of similar grade and the RS's highest fitness report average of any report written on Marines of a similar grade. The first reflects the, "mean of the numeric value for all fitness reports written by the RS on Marines of a similar grade. The latter reflects the highest fitness report average of any report written by the RS on Marines of similar grade." (MCO1610.7F, 2006, G-2) These values enable the calculation of both relative values and cumulative relative values. Relative values "reflect how the fitness report average of an individual report compares to the RS's average of all fitness reports written by the RS on Marines of the same grade [and] the highest fitness report average of any report written by the RS on a Marine of the same grade as the MRO." (MCO1610.7F, 2006, G-2) The cumulative relative value reflects the cumulative relative value of the MRO's fitness report based on the RS's rating history for Marines of the same grade as the MRO. This number is variable and will change as the RS writes additional reports on Marines of the same grade as the (MRO. MCO1610.7F, 2006, G-2)

[9] Reporting Seniors should mark block "H" for those instances when the period of observation precludes an accurate assessment. (MCO 1610.7F, 2006, p. 4-24).

Section I gives an RS the opportunity, not provided elsewhere in the report, to articulate important information about the MRO. This section is where the RS enters mandatory, directed, and additional comments. The PES manual describes these comments as followed:

> Mandatory comments are those required to give the CMC a more complete picture of the MRO's professional character.
>
> Directed comments as required by this manual, provide the CMC amplifying information concerning the MRO.
>
> Additional comments may span a wide variety of events, accomplishments, or activities that the RS deems important to convey to the CMC.

Ultimately, section I exists to allow the RS to make a more detailed account of a Marine's professional character, conduct, and performance while in the performance of his or her assigned duty as well as outside of these duties. Comments in this section should be objective, concise, and free from superlative language.

Section J is the signature and date section. Reporting Seniors are required to sign and date the report while MROs are only required to sign the report if it is adverse. Section K allows the RO to indicate if he or she believes they have had sufficient observation time and provides them an opportunity to concur or not with the RSs evaluation of the Marine. If the RO believes they have had enough observation time they are required to grade the MRO on a scale, called the Christmas Tree, from unsatisfactory to eminently qualified, (there are six other choices between these two markings). The RO is also required to provide written comments in this section. These comments should amplify the "Christmas Tree" marking, evaluate potential for promotion, command, assignment, resident professional military education, retention, and put RSs evaluation in perspective. The last section, Section L, is only completed if there is an addendum to the fitness report. Addendums are not normally used unless there is a narrative for an adverse report, when a high marking needs to be justified, section I comments exceed space provided, the MRO offers a rebuttal statement to an adverse report, or the MRO has been recommended for accelerated promotion.

E. CHAPTER SUMMARY

A Marine Officer's career is impacted by his or her performance at TBS, while other factors affecting promotion grow increasingly influential as Marines progress in their careers. The lineal number they receive upon finishing TBS will play a large role in when an officer is promoted in relation to their peers.

The Marine Corps performance evaluation system is the best indicator of how an officer performed in the various aspects of his or her job over a specified period of time. The fitness report is used to track an officer's performance through various jobs, ranks, and periods of time while accounting for the different supervisors an officer will have throughout his or her career. The PES is the main tool the Marine Corps uses to formally evaluate Marine officers.

Unlike in other services the promotion system in the Marine Corps does not promote officers based on their MOS or occupation field. Instead, the Marine Corps promotes its officers based on who is the best or most fully qualified. The Marine Corps tries to select officers to the next grade whom they believe have the potential to perform sufficiently in the next grade. The PES was designed to aide in the selection process by allowing reporting seniors to efficiently and impartially evaluate Marine officers.

III. LITERATURE REVIEW

Numerous prior studies have focused on military officer performance. Most of these studies examined the effect of background factors on various officers' performance, such as accession program, aptitude scores, and demographic characteristics. This chapter will review several of the studies that focus on performance of USMC officers at TBS and the relationship between MOS assignment and success in the operating forces. To conduct this review we chose four studies that most closely correlated with the purpose of our research. These studies are relevant to our research because they have examined variables impacting performance at TBS and factors impacting Marine Corps officer success in the operating forces as measured by promotion, retention, or fitness report scores. Our thesis examines the effect of Marine Corps officer performance at TBS, accession source, and MOS assignment on performance in the operating forces, as measured by the relative value of officer fitness reports.

Ergun (2003) studied the factors affecting career development of U.S. Marine Corps officers. Specifically, he sought to analyze how different officer accession programs affected the careers of Marine officers. For his analysis, Ergun used three different data sets. The first was the Marine Corps Commissioned Officer Accession Career (MCCOAC) data file. This file was prepared by the Center for Naval Analysis (CNA) and contained 28,058 observations from officer entry cohorts for fiscal year 1980 through fiscal year 1999. It also included two fitness report files. One contained officer's fitness reports that were written under the old PES system, which was in effect until 1998. This file consisted of more than 48,000 officers in grades O-1 through O-8. The second file contained fitness reports written between 1998, when the new fitness report system was implemented, and 2001. This file included 52,366 fitness reports on officers in the grades of O-1 through O-6.

Ergun used TBS class standing percentile, retention to ten years of commissioned service, and promotion to O-4 and O-5 ranks as indicators of performance. He also created a performance index (PI) based on fitness report marks. He took traits for a given

report and converted them into numerical values to create the PI. He created separate PIs for the old and new fitness reports. Figure 3 shows these steps.

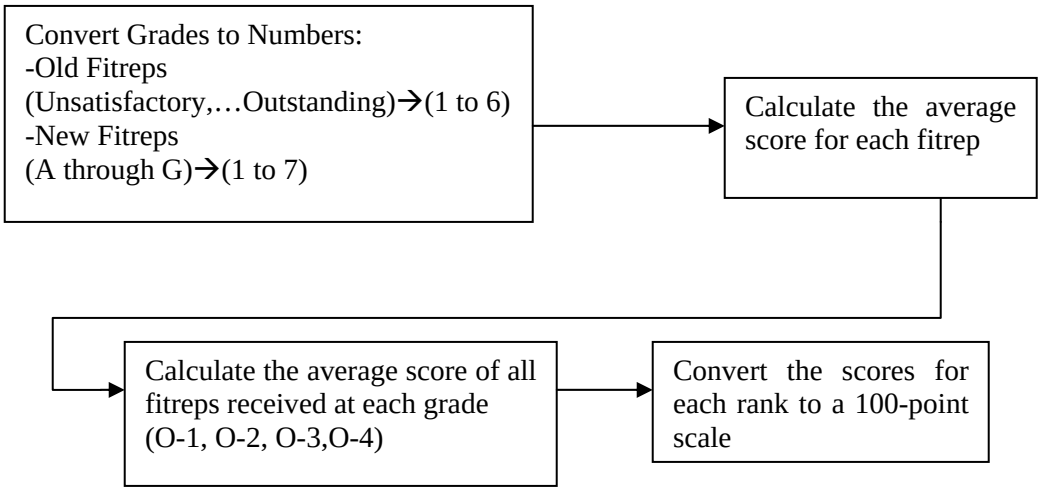

Figure 3. Steps in calculating Performance Index in Ergun (2003)

Ergun used these performance indicators as dependent variables in various models. He used a variety of methods to estimate these models, including OLS, probit, bivariate probit, and non-linear logit equations. Table 2 shows the effects of commissioning sources and being prior enlisted on performance indicators. Column 1 indicates their effect on overall TBS class rank. Columns 2, 4, and 6 contain old and new fitness report results; the first lines are old report estimates. Column 3 contains their effect on retention to 10-years of service as an officer, and columns 5 and 7 show their effects on promotion to O-4 and O-5 respectively.

Table 2. Multivariate Regression Results for Commissioning Sources.[10]

	TBS overall class rank (%Rank)	O2 PI (Perc. Points)	Retention to 10-year (Perc. Points)	O3 PI (Perc. Points)	O-4 Prom. (Perc. Points)	O4 PI (Perc. Points)	O-5 Prom. (Perc. Points)
USNA (base case)	-	-	-	-	-	-	-
NROTC	2.7***	-0.22*** 0.95*	N.S.	-0.47*** N.S.	7.5***	-0.12* N.S.	9.4**
PLC	-1.0*	-0.52*** -1.03**	-3.9**	-0.77*** -2.71***	10.0***	-0.12* -1.61***	6.3**
OCC	-4.9***	-0.46*** N.S.	-10.5***	-0.85*** -1.33***	13.9***	N.S. -1.23**	N.S.
MECEP	16.5***	0.35** 2.94***	15.0***	-1.28*** 1.54***	N.S.	N.S. N.S.	21.1***
ECP	4.1***	-0.25* 1.70**	N.S.	-1.19*** N.S.	9.1***	-0.32** -2.84***	25.0***
MCP	13.7***	N.S. 5.72***	N.A.	N.A.	N.A.	N.A.	N.A.
Prior Enlisted	3.3***	0.21*** 0.66*	6.7***	-0.528*** 1.50***	N.S.	N.S. N.S.	-27.5***

*Significant at the 0.10 level; **Significant at the 0.05 level; ***Significant at the 0.01 level Perc. Points=Percentage Points; N.S=Not significant; N.A.=Not Applicable

The results of Ergun's study suggest that the performance of USNA graduates and NROTC graduates is fairly similar. NROTC graduates rank slightly higher at TBS and are more likely to be promoted to O-4 and O-5. On the other hand, their PI scores during grades O-2 through O-4 are lower than those of Naval Academy graduates and retention to the 10-year point is the same for both. Compared to USNA graduates, PLC graduates have a lower class rank at TBS, a lower PI at each rank, and lower retention to 10 years of commissioned service; however, for those who stay, PLC graduates are more likely to be promoted to O-4 and O-5. OCC graduates performed lower in every category, except promotion to O-4 where they had a 14-percentage points higher promotion rate, when compared to USNA graduates. MECEP students outperformed Naval Academy graduates at every level except for older cohorts under the O-3 PI based on the old fitness report. MECEP students also outperformed USNA graduates under the O-4 promotion and the O-4 PI based on the old or new fitness report, which were not statistically

[10] Ergun 119.

significant. Enlisted Commissioning Program (ECP) graduates performed better at TBS than USNA graduates, were more likely to stay to 10 years, but they had lower PI scores across every grade. Despite this, they were more likely to be promoted to O-4 and O-5. There were insufficient observations to analyze the performance of Meritorious Commissioning Program (MCP) graduates except for TBS class rank and the O-2 PI, where they performed better than USNA graduates.

Based on his findings Ergun recommended that the Marine Corps conduct further research on enlisted commissioning programs, prior enlisted officers, and the O-5 promotion process. He also suggested further research on identifying factors correlated with OCC and PLC graduates' higher rates of promotion to major. Lastly he recommends examining USNA graduates' and minorities' poorer performance at TBS.

Finley (2002) "compare[d] the performance of Naval Academy graduates at TBS as a function of the different Marine-specific summer training programs that were required of Naval Academy graduates over time." His main focus was to determine whether participation in OCS/Bulldog, which was required for Naval Academy Classes from 1989 to 1992, significantly impacted performance at TBS.

His analysis relied on data on Naval Academy graduates from class years 1988 to 1999. Finley merged data from the Naval Academy's Office of Institutional Research, Planning and Assessment, which contained information on graduating classes of 1988 to 2000, with data from the Manpower section at Headquarters Marine Corps. This data covered each officer's performance at TBS from 1980 through 1999. The merged data file contained 1,615 records after dropping USNA midshipmen who were not Marine service selectees as well as other individuals for reasons varying from incomplete records to failing to graduate from the Naval Academy.

Finley used ordinary least squares (OLS) to estimate the effect of Marine-specific summer training on the TBS class rank. His TBS performance model also included basic midshipmen demographics, ground or aviation option, Naval Academy varsity athlete status, order of merit, prior enlisted experience, major area of study, parents' military experience, service selection participation, and service assignment/capstone course

participation. Finley found that participation in Marine-specific training, namely participation in Bulldog, increased performance of Naval Academy students at TBS, holding all else constant.[11] He also found that order of percentile merit, cumulative military QPR, and OCS/Bulldog participation were the top predictors of performance at TBS.[12]

Finley recommends that the Naval Academy reevaluate its summer training programs and expand Marine-specific summer training programs. Finley suggests creating a Marine-specific training pipeline after third-class summer so Academy midshipmen interested in becoming Marine officers could acquire and hone the requisite skill set necessary for success at TBS.

Perry (2006) explored the relationship between PMOS and survival/promotion for mid- grade officers in the Marine Corps. Perry evaluated whether PMOS influenced promotion when an officer was in-zone for O-4 and O-5, and whether PMOS influenced retention rates for officers with less than ten years of commissioned service.

Perry's promotion analysis was based on data from the MCCOAC, which covered fiscal years 1980 to 1999, and a Marine Officer Cohort data file from the Defense Manpower Data Center (DMDC), which contains cohort data for fiscal years 1980 through 2001. He then analyzed cohorts from FY 1980 through 1993 in promotion and retention models to examine the effects of PMOS on selection and survival of majors at roughly 10 years of service. He used FY 1980 through 1988 cohorts to analyze the promotion and retention of lieutenant colonels at approximately 15 years of service. Perry's statistical analysis used logistic regression to analyze promotion outcomes and Cox proportional hazard models to analyze survival over time.

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[11] Comparison of means showed that those participating in the OCS/Bulldog training program had a 2.54 percentile point advantage in class standing at The Basic School compared to those completing Leatherneck Training and a 6.35 percentile point advantage compared to the No-Training cohort. The primary prediction model found a 9.23 percentile point higher difference in TBS class standing for those who participated in OCS/Bulldog compared to those who participated in Leatherneck while the secondary model found a 16.34 percentile point difference. (Finley 91).

[12] Percentile order of merit is an individual's standing at graduation from the Naval Academy. Cumulative Military Performance QPR is an important component of a midshipman's order of merit.

The results of Perry's study indicate several points regarding promotion and retention. He found that 94 percent of the 32 PMOSs were significant predictors of the probability of an officer staying until 10 years of commissioned service, when compared to an infantry officer. All pilot PMOSs, except EA6B and C130, were positively correlated with the probability of staying. All of the remaining PMOSs were negatively correlated with staying until 10 years of commissioned service, when compared to an infantry officer. Perry also found that of all the PMOSs 32 percent were significant predictors of whether an officer was promoted to O-4.[13] Specifically, the PMOS 0402, logistics officer, was positively correlated with promotion (when compared to infantry) while the majority of pilot PMOSs were negatively correlated. The remaining 22 PMOSs were not significantly different from infantry in their promotion rates to O-4. For promotion to O-5, Perry found that 19 percent of PMOSs were significant predictors of whether an officer is promoted.[14] Air defense controllers and FA18 PMOSs were positively correlated with promotion to O-5 (compared to infantry officers), while Intelligence, Engineers, Public Affairs, and CH53-D were negatively correlated with O-5 promotion.

Based on his findings, Perry recommended that the Marine Corps offer career bonuses to officers in critically undermanned PMOSs, increase accessions in these PMOSs, lower accessions in PMOSs which are never short handed, and increase the minimum obligation time for critically undermanned PMOSs. Perry also made recommendations regarding promotion board procedures. He suggests having the president of the board group officers by PMOS and have different individuals brief each PMOS. He argues that if this were done, the briefer could recommend to the board the most qualified officer within these critically short PMOSs and allow board members to compare the qualified officers in undermanned PMOSs to qualified officers in other PMOSs.

[13] Officers with a critically short PMOS have on average a three percent higher promotion rate to O-4 than officers in the remaining PMOSs. (Perry p. 130).

[14] Officers with a critically short PMOS have a three percent lower promotion rate to O-5 than officers in the remaining PMOSs. (Perry p. 130).

North and Smith (1993) examined completion of Officer Candidate School (OCS), survival to commissioning, and class rank at TBS. Prior to the study they observed that the majority of officer candidates do not become commissioned officers because they do not complete OCS or they do not accept a commission. "OCS attrition has been especially high among female and minority candidates…The differential continues at the next phase of officer training, TBS. Although about 95 percent of the students graduate from TBS, the average class rank of minorities and women is lower than that of white males. (North and Smith, p. 1) They stated three objectives in conducting this study; estimate whether the gap in performance is a result of discrimination towards minorities, identify the potential officer candidates with the best chances of being commissioned and having a successful career, and identify efficiencies in the mix of OCS programs.

They used data from the Automated Recruit Management System ARMS.[15] Data was available on Platoon Leaders Course (PLC) and Officer Candidate Course (OCC) graduates, as well as USNA and NROTC accessions. They also gathered data from TBS that covered FY 1988 through FY 1991 and data from the Headquarters Master File (HMF) which tracks changes in status and contains information on Marines from his or hers ARMS file.[16] The longitudinal file on Marine Corps personnel was merged with TBS information and yielded 15,970 records for their analysis.

North and Smith used a logit model to estimate the probability of OCS attrition as a function of whether a candidate failed or passed OCS. The study found that a performance gap exists in whites and blacks even when they adjusted for such factors as physical fitness and aptitude. More specifically, the most important factor in determining the completion of OCS and commissioning for men was prior Marine experience.[17] The

[15] ARMS contains data on all applicants to the Marine Corps both officer and enlisted. A candidate's record begins when the recruiting station inputs basic application information.

[16] CNA receives quarterly extracts of the HMF and has used them to build a longitudinal file for all active-duty Marine Corps personnel.

[17] Other effects were associated with physical fitness test (PFT) scores and race/ethnicity; all minorities were 8 percentage points less likely than whites to complete OCS. (North and Smith 1993).

greatest determinant of class rank at TBS was race.[18] However, they did not believe that there was any "overt discrimination" but that part or all of the gap in completion rates likely resulted from other factors that were not measurable.

The authors recommended several actions the Marine Corps could take to decrease the performance gap. First, they recommended expanding enlisted-to-officer commissioning programs. Secondly, they suggested lowering aptitude standards, which may seem counterintuitive. However, due to the large number of African American candidates that require aptitude waivers, 44 percent compared to 14 percent of whites, a perception has been created that all African American Marine Corps officer have entered the officer pipeline with a waiver and thus "have been given an unfair advantage and are not fully qualified…by lowering the standard, the Corps can still pick the best without imposing the waiver burden on all." (North and Smith, p. 4). Lowering the aptitude standards would also lower the need for aptitude waivers and theoretically eliminate the perception that black officers have earned their commission because of a waiver and not because they are fully qualified. Next, they recommended recruiting more OCC candidates as opposed to PLC candidates, as well as students that attend very competitive schools and schools with NROTC units. They also recommended implementing a mentoring program between Officer Selection Officer (OSO) and candidate in which OSO's can prepare candidates both physically and emotionally for OCS and TBS. Lastly, they recommended recording and retaining more information on candidates and officers so that a thorough analysis can be conducted on how accession characteristics correlate with later success.

This thesis compares performance at TBS, specifically leadership, academic, and military skills performance, to performance in the operating forces. In reviewing previous literature, we found that various performance measures were used to determine the success of an officer or the effectiveness of a particular commissioning program. Promotion and retention are the most widely used measures of success; however, fitness report scores have been used as well. Studies have also addressed the question of

[18] African-Americans had a class rank percentile 22 points below that of whites.

whether performance as a TBS student is correlated with various measures of success such as promotion and retention. Ergun's thesis compared the impact of the various accession programs on performance at TBS and performance throughout an officer's career. Finley studied Naval Academy graduates' performance at TBS as a function of the various Marine-specific training programs available to Naval Academy midshipman at various times. Perry examined PMOS assignment and survival for mid grade Marine Corps officers. Lastly, can studies have focused on the effects of demographic variables, specifically race and gender, and their effect on performance at TBS and OCS.

While some of the results of these studies differ, several consistent findings emerge regardless of the data, methodology, or models used. Performance at TBS and prior enlisted experience are found to be significant predictors of promotion and retention. Furthermore, prior enlisted experience and race are significant predictors of performance at OCS and TBS. What is not consistent, is the impact and significance of gender and specific accession programs on performance at TBS, promotion, and retention. Ergun's study indicates that the performance of women at TBS is significantly lower, while promotion rates and retention rates are higher than their male counterparts. Perry's study indicates that women's performance, promotion, and retention relative to men varies widely depending on other factors such as rank, accession program, and marital status. The impact and significance of accession programs depends on whether performance, promotion, or retention is being measured. Ergun's study found that ECP and NROTC programs increase the likelihood of promotion relative to USNA; however, the findings on their impact on retention are mixed. In regard to performance at TBS his study suggests almost every accession program, except PLC and OCC, are positively correlated with performance at TBS relative to USNA. The CNA study indicates that USNA graduates have higher TBS class ranks compared to NROTC graduates, whereas PLC and OCC have lower TBS class rank.

While there are conflicting findings in the literature regarding the effect of various background factors on measures of performance, there is concurrence that prior exposure to the military will have a positive and significant impact on measures of performance for Marine Corps officers in the training pipeline and operating forces. These findings, along

with data from fitness reports completed after 1999 when changes to the PES went into effect, provide an opportunity to focus on a specific area of performance, leadership at TBS, and its relationship with performance of junior officers in the Marine Corps operating forces.

IV. DATA SOURCES, DESCRIPTIVE STATISTICS, AND VARIABLE DESCRIPTIONS

A. DATA SOURCES

1. Total Force Data Warehouse Dataset

A dataset was created from the Marine Corps' Total Force Data Warehouse (TFDW) that included primarily demographic data for all officers who were newly commissioned between 1999 and 2005 inclusive. Also included in the TFDW dataset was basic service data, such as Armed Forces Active Duty Base Date and Pay Entry Base Date. TFDW data is gathered in snapshots that are taken from the Marine Corps' electronic administrative systems.

2. Center for Naval Analysis TBS Dataset

The Center for Naval Analysis warehouses TBS performance data, to include overall class ranking and final percentage, rankings and percentages for each of the three areas of evaluation (Academics, Military Skills, Leadership), TBS class size, and top three MOS preferences. This dataset also included numerous demographic variables and a large number of performance variables. The demographic variables included marital status, race, gender, ethnicity, and commissioning source. Performance variables contained in this dataset include rifle, pistol, and PFT scores recorded at various stages in the officer's career. The CNA dataset contained most of the explanatory variables used in our models. TBS performance data was obtained from all TBS classes at the beginning of Fiscal Year (FY) 1998 to the end of FY 2005.

3. Manpower Management Support Branch (MMSB) FITREP Dataset

Fitness report data was obtained from MMSB. All variables in this dataset were compiled from values that can be found on the Master Brief Sheet as discussed in Chapter II. Variables included were Relative Value at processing, Cumulative Relative

Value, FITREP Score, Reporting Senior Average at Processing, Reporting Senior Cumulative Average, Grade of Marine Reported On, Fitness Report dates covered, and Reviewing Officer assessment. Appendix B. contains a sample Master Brief Sheet. This data was essentially time series data, in which each officer had his series of Fitness Reports captured sequentially from the officer's first FITREP, up to the last FITREP the officer received by the end of FY 2005. The dataset includes officers who have separated from the Marine Corps prior to the end of FY 2005, thus their FITREPS are included until they separated. The dataset also includes FITREP data of officers who were not yet promoted to the next rank. Officer performance as indicated by FITREP scores was used as the dependent variable in our models.

B. DESCRIPTIVE STATISTICS AND VARIABLE DESCRIPTIONS

Descriptive statistics for each variable used in this analysis are presented in Table 3. These descriptive statistics are from the entire dataset, which includes all contract aviators. Because of the uniqueness of contract aviators, we also analyze a restricted sample that only includes ground assignable officers. Descriptive statistics for ground assignable officers only can be found in Table 4.

Table 3. Descriptive Statistics for All Officers

Variable	Obs	Mean	Std Dev	Min	Max
Cumulative Relative Value	6141	.1794124	4.101934	-10	10
Cumulative Relative Value, O1	4637	.2926733	5.281623	-10	10
Cumulative Relative Value, O2	5472	.366346	4.600574	-10	10
Cumulative Relative Value, O3	2180	-.3507814	5.123115	-10	10
Overall Class Rank %	6141	49.78489	28.83709	0	99.61539
Academic Class Rank %	4814	49.33091	28.85179	0	99.61539
Leadership Class Rank %	4814	50.86372	28.73626	0	100
Military Skills Class Rank %	4814	49.35114	28.7514	0	100
In Top Third of TBS Class	6141	.3274711	.4693289	0	1
In Middle Third of TBS Class	6141	.3290995	.4699244	0	1
In Bottom Third of TBS Class	6141	.3434294	.474892	0	1
Received 1st MOS Preference	6141	.4494382	.4974774	0	1
Received a top 3 MOS preference	6141	.6065787	.4885487	0	1
Did not receive a Top 3 MOS	6141	.3934213	.4885487	0	1
Female officer	6141	.0884221	.2839309	0	1
Male officer	6141	.9115779	.2839309	0	1
PLC commission	6141	.2610324	.4392333	0	1
OCC commission	6141	.3002768	.4584156	0	1
NROTC commission	6141	.14851	.3556338	0	1
MECEP commission	6141	.1022635	.3030192	0	1
ECP commission	6141	.0420127	.2006345	0	1
USNA commission	6141	.1104055	.31342	0	1
MCP commission	6141	.0201922	.1406686	0	1
Prior enlisted Marine	6141	.1644683	.3707302	0	1
Age at commissioning	5976	24.75686	2.837464	19.75	35
TBS class FY98	6141	.0019541	.0441654	0	1
TBS class FY99	6141	.197362	.3980402	0	1
TBS class FY00	6141	.2160886	.4116089	0	1
TBS class FY01	6141	.2025729	.4019495	0	1
TBS class FY02	6141	.1690278	.374807	0	1
TBS class FY03	6141	.1411822	.3482378	0	1
TBS class FY04	6141	.0649731	.2464985	0	1
TBS class FY05	6141	.0068393	.0824233	0	1
White officer	6141	.8324377	.3735075	0	1
Black officer	6141	.0617163	.2406592	0	1
Race other than black or white	6141	.0299625	.1704979	0	1
Single officer	6141	.7288715	.4445785	0	1
Married officer	6141	.2507735	.4334937	0	1
Divorced officer	6141	.0198665	.1395527	0	1
Widowed officer	6141	.0001628	.0127609	0	1
Separated officer	6141	.0001628	.0127609	0	1

Table 4. Descriptive Statistics for Ground Assignable Officers

Variable	Obs	Mean	Std Dev	Min	Max
Cumulative Relative Value	5058	0.3046227	4.132904	-10	10
Cumulative Relative Value, O1	4347	0.3284367	5.281314	-10	10
Cumulative Relative Value, O2	4554	0.4409112	4.588262	-10	10
Cumulative Relative Value, O3	1616	0.058929	5.420991	-10	10
Overall Class Rank %	5058	48.45062	29.24644	0	99.61539
Academic Class Rank %	4007	48.34665	29.14428	0	99.61539
Leadership Class Rank %	4007	50.60166	29.17268	0	99.61539
Military Skills Class Rank %	4007	47.40728	29.03143	0	100
In Top Third of TBS Class	5058	0.3155397	0.4647764	0	1
In Middle Third of TBS Class	5058	0.3169237	0.4653234	0	1
In Bottom Third of TBS Class	5058	0.3675366	0.4821819	0	1
Received 1st MOS Preference	5058	0.3325425	0.4711708	0	1
Received a Top 3 MOS Preference	5058	0.5233294	0.4995048	0	1
Did not receive a Top 3 MOS	5058	0.4766706	0.4995048	0	1
Female officer	5058	0.0988533	0.2984945	0	1
Male officer	5058	0.9011467	0.2984945	0	1
PLC Commission	5058	0.2522736	0.4343604	0	1
OCC Commission	5058	0.2953737	0.4562557	0	1
NROTC Commission	5058	0.1528272	0.3598564	0	1
MECEP Commission	5058	0.1081455	0.3105948	0	1
ECP Commission	5058	0.0484381	0.2147114	0	1
USNA Commission	5058	0.1039937	0.3052825	0	1
MCP Commission	5058	0.0231317	0.1503365	0	1
Prior Enlisted Marine	5058	0.1797153	0.3839881	0	1
Age at Commissioning	4929	24.85159	2.909381	19.75	35
TBS Class FY 98	5058	0.0021748	0.0465883	0	1
TBS Class FY 99	5058	0.1868327	0.3898157	0	1
TBS Class FY 00	5058	0.2077896	0.4057655	0	1
TBS Class FY 01	5058	0.198102	0.3986089	0	1
TBS Class FY 02	5058	0.1686437	0.374474	0	1
TBS Class FY 03	5058	0.1553974	0.3623189	0	1
TBS Class FY 04	5058	0.0757216	0.2645784	0	1
TBS Class FY 05	5058	0.0053381	0.0728741	0	1
White Officer	5058	0.8169237	0.3867673	0	1
Black Officer	5058	0.0689996	0.2534785	0	1
Race other than black or white	5058	0.0336101	0.1802412	0	1
Single officer	5058	0.7168841	0.4505568	0	1
Married officer	5058	0.2611704	0.439316	0	1
Divorced officer	5058	0.0213523	0.1445701	0	1
Widowed officer	5058	0.0001977	0.0140608	0	1
Separated officer	5058	0.0001977	0.0140608	0	1

Note that the academic and military skills rankings of the ground assignable officers are lower than the academic and military skills ranking percentages for the data that includes the contract aviators, whereas the leadership ranking percentage is nearly the same in the two samples. Ground assignable officers also have lower top and middle third percentages and higher bottom third percentages in these tables. The percentage of females is greater by 1% in the ground assignable group. Prior enlisted Marines are also more heavily represented in the ground assignable group.

The marital status variables all denote the marital status of the officer at the time of commissioning. Also of note is that there are 466 observations that contained no race code information. Therefore the means of the binary variables for race (which represent percentages) do not add to 100% as we would expect. Last, the TBS FY variables denote in which FY the officer attended TBS.

1. Cumulative Relative Values

Average cumulative relative values were calculated from the raw FITREP data provided by MMSB. An example of the raw FITREP data is shown in Table 5, below:

Table 5. Examples of FITREP Data for Two Officers

ID	Grade	From Date	To Date	Rel Val at Proc	Cum Rel Val
A	2NDLT	10-Apr-02	11-Oct-02	NA	NA
A	2NDLT	12-Oct-02	10-Apr-03	NA	NA
A	2NDLT	11-Apr-03	31-Jul-03	NA	89.66
A	2NDLT	1-Aug-03	31-Jan-04	NA	92.98
A	2NDLT	1-Feb-04	29-Mar-04	89.78	89.78
A	1STLT	7-Apr-04	31-Oct-04	80	81.32
A	1STLT	1-Nov-04	12-May-05	90.72	89.99
A	1STLT	13-May-05	28-Jun-05	NA	NA
A	1STLT	29-Jun-05	31-Oct-05	92.86	92.5
B	2NDLT	17-Jul-00	19-Jan-01	NA	NA
B	2NDLT	20-Jan-01	12-Apr-01	89.53	87.61
B	1STLT	12-Apr-01	21-Jun-02	NA	NA
B	1STLT	22-Jun-02	30-Nov-02	NA	NA
B	1STLT	4-Dec-02	24-Jan-03	NA	NA
B	1STLT	24-Jan-03	31-May-03	100	100
B	1STLT	1-Jun-03	30-Nov-03	100	100
B	1STLT	27-Nov-03	30-Apr-04	NA	90.86

B	1STLT	1-May-04	5-Jul-04	NA	NA
B	1STLT	6-Jul-04	2-Oct-04	100	97.26
B	1STLT	4-Oct-04	1-Jan-05	93.69	93.26
B	CAPT	1-Jan-05	6-Apr-05	84.73	83.82
B	CAPT	7-Apr-05	25-May-05	NA	NA

Officer A was commissioned in March of 2002, and his first two fitness reports were "Not Observed" reports. These first reports were most likely from TBS and the officer's MOS producing school. Officer A then received 3 observed fitness reports as a second lieutenant. He was then promoted to the rank of first lieutenant in April of 2004. As a first lieutenant, he received 2 observed fitness reports, one not observed fitness report (for a period of less than 89 days, insufficient observation time), and then another observed fitness report. Officer A was not followed long enough in the data to have been promoted to Captain.

Officer B was commissioned in March of 1999. He did not receive his first fitness report under the new PES until January of 2001, which was a "Not Observed" report. Officer B's next report was an observed report from January 2001 to April 2001. Officer B then received a series of "Not Observed" reports from April of 2001 until January of 2003. This long gap in observed time is because officer B is an aviator. The time spent in flight training is covered by "Not Observed" fitness reports. Officer B then received 3 observed reports, one not observed report, 3 more observed reports, and another not observed report. Officer B was followed in the data long enough to have been promoted to captain, and to have received 2 fitness reports at that rank.

Average cumulative relative values capture the officer's performance in the Operating Forces by measuring that officer's performance relative to the reporting senior's average. As discussed in Chapter II, the Reporting Senior's average is always 90; therefore a cumulative relative value for a fitness report that exceeds 90 is an "above average" report. Conversely, a report that has a cumulative relative value below 90 is a "below average" report.

In the raw FITREP data, each FITREP received from the beginning of FY99 to the end of FY05 for each officer in the dataset is a unique observation. In order to calculate average cumulative relative values, this data was first collapsed by unique identifier and rank, which gave the average cumulative relative values for each officer at each rank. For example, the first officer in the table (officer A) would have an average cumulative relative value for all FITREPs received as a second lieutenant and another average cumulative relative value for all FITREPS received as a first lieutenant. Because the second officer in the table entered the Marine Corps so much earlier than the first, he would have average cumulative relative values received as a second lieutenant, first lieutenant, and captain.

The raw FITREP data was then collapsed only by unique identifier to produce a single average cumulative relative value for each officer. In the end, we obtain four cumulative relative value variables. We subtract 90 from all these variables so that the resulting performance measures represent how far above or below average these cumulative relative values are. As noted in the descriptive statistics tables, Table 3 and Table 4 none of the means of the average relative cumulative value variables is 0. This is because the reporting senior profile is calculated so that every report that is written by the reporting senior is included in the calculation of that reporting senior's average. For example, suppose a reporting senior writes several reports on second lieutenants who are not in our dataset. Then that same reporting senior writes several reports on second lieutenants who are in our dataset. All these reports are used in the calculation of the reporting senior's average. But it is unlikely that the officers in our dataset will have average cumulative relative values that are zero because the reporting senior's average is not calculated per officer, but rather by all officers of the same rank on whom the reporting senior has written reports. The maximum and minimum values for the cumulative relative values are then by definition 10 and -10, as each reporting senior's profile dictates that the worst report written by that reporting senior has a value of 80 and the best report has a value of 100. The FITREPS in the data that have "NA" for the cumulative relative value are "Not Observed" reports. These reports are ignored in the calculation of average cumulative relative values.

There are 6,141 observations for the cumulative relative value variable, which represent the 6,141 officers who were commissioned, graduated from TBS, and have FITREP scores from observed fitness reports during the years 1999 to 2005.

For the 'by grade' average cumulative relative value variables in Table 3, we see that the most observations come when the officers are at the rank of first lieutenant (N=5,472). This is logical, as many officers do not receive many observed fitness reports during their time as second lieutenants. This is due to the amount of time it takes a newly commissioned second lieutenant to reach the operating forces. Second lieutenants remain at that rank for 2 years from the date of commission. Considering that TBS is 6 months, MOS schools can range in length anywhere from approximately 4 weeks to 6 months or more for ground assignable officers to 2-3 years for aviators, it is easy to see that there is less opportunity for second lieutenants to be evaluated.

In this dataset, many of the officers are not followed in the data long enough to be promoted to the rank of captain and subsequently receive an observed fitness report for that grade. Assuming that the officers in the dataset would all be promoted to captain at exactly 4 years from their commissioning date (an unrealistic assumption) only the officers who were commissioned between 1999 and 2001 would be followed in the data long enough to have been promoted to captain. Therefore, there are relatively few officers in the data who have observed fitness reports at the rank of captain. Likewise, as this FITREP data is longitudinal in nature, we can expect that, in most cases, officers who are commissioned earlier in the period covered by the data will have more reports than those who are commissioned later in the period covered. This will not always be the case, however, as there are numerous factors that determine how many observed reports an officer receives over a given period of time. For example, while officers are attending formal schools, they do not receive observed fitness reports so officers who attend longer formal schools will likely have fewer observed reports. Also, an officer who has a succession of reporting seniors that transfer into and out of their jobs may receive a greater number of observed reports, provided the reporting seniors stay on the job long enough so that the fitness report must be an observed report. We can control for the

length of time cohorts are observed in the data, and the corresponding difference in the number of fitness reports received, by including cohort dummies in our performance models.

Ultimately, each officer in our dataset completed TBS and had his performance evaluated by at least one observed fitness report. As the aim of this study is to determine the relationship between TBS performance and performance as a junior officer, we did not feel it was necessary to account for those officers who separated from the Marine Corps prior to 2005, either voluntarily or involuntarily and those who do separate from the Marine Corps are not removed from our samples.

As shown in Table 3, the mean value of the cumulative relative value variable in the unrestricted sample is 0.179, and as shown in Table 4 the mean for the cumulative relative value for the restricted sample is 0.305. This tells us that the ground assignable officers in our dataset have higher average fitness report scores than the contract aviators. One possible explanation for this may be that ground assignable officers have more opportunity to improve through doing than do aviators. Ground assignable officers normally assume their duties within a short time of graduating from their primary MOS school, and immediately begin to build their experience. Aviators spend years in training before they are evaluated in an operational unit.

2. TBS Performance Variables

All four TBS performance variables are continuous variables, having values ranging from zero to 100. TBS performance data from CNA included final percentages and numerical class standings for the three areas of evaluation (Academics, Military Skills, and Leadership) and the final overall percentage and class standing. Because class sizes differ, we normalized these standings for class sizes using the following formula:

$$100 - ((\underline{\text{rank}} / \text{class size}) * 100)$$

In this formula, rank was either the officer's final overall TBS rank, or the final Academics, Leadership, or Military Skills rank. In essence, this formula reversed the class rank so that larger values (rather than smaller ones) indicated better performance at TBS.

As shown in Table 3, there are 6,141 observations for the overall class ranking percentage, yet there are only 4,814 observations for the leadership, military skills, and academics rankings. The CNA dataset is missing all TBS performance data except final GPA and final rank for all observations for FY 2000. This accounts for the difference in the number of observations between the overall class ranking percentage and those of leadership, academics, and military skills.

The mean values for the TBS performance variables in the unrestricted sample are 49.33 for academic ranking, 50.86 for leadership ranking, 49.35 for military skills ranking, and 49.78 for the overall TBS class ranking. The mean values in the restricted sample are 48.35 for academic ranking, 50.60 for the leadership ranking, 47.41 for the military skills ranking, and 48.45 for the overall TBS ranking. A comparison of these means shows us that contract aviators have higher averages in all TBS performance areas. Because several of the cohorts are not completely represented in the dataset, the means do not equal 50.00 as is expected.

3. Top Third, Middle Third, Bottom Third Variables

The CNA dataset included a variable indicating in which third each officer in the dataset was placed. Three binary variables for an officer's placement in the system of thirds were then created from this raw variable.

Top Third: = 1 if the officer was in the top third of TBS class, = 0 otherwise
Middle Third: = 1 if the officer was in the middle third of TBS class, = 0 otherwise
Bottom Third: = 1 if the officer was in the bottom third of TBS class, = 0 otherwise

As indicated in Table 3, top third and middle third, each account for slightly less than 33% of the observations, while bottom third accounts for slightly more than 33% of

the observations. This is due to the fact that the TBS company staff, specifically the company Executive Officer, has some latitude in splitting the company into thirds for the Quality Spread, as it is rare that the number of ground assignable officers in a TBS company is exactly divisible by 3.

4. MOS Preference Received Variables

As part of the MOS assignment process, the students provide a list, in order of preference, of MOSs to which they would like to be assigned. CNA maintains the top 3 MOS preferences for each student. Three binary variables were created to capture MOS preference and actual MOS match.

First MOS Received: = 1 if the officer received his/her first MOS, = 0 otherwise
Top Three MOS Received: = 1 if the officer received a top three MOS, = 0 otherwise
Other MOS Received: = 1 if the officer did not receive a top three MOS, = 0 otherwise

As indicated by the Table 3, 60.7% of officers received an MOS that was in their top 3 MOS preferences. This number includes all contract aviators, which were determined to all have received their first preference of MOS. Contract aviators account for 1078 observations from the data. The percentage of ground assignable officers who were assigned an MOS in their top 3 preferences is 52.3%, as shown in Table 4.

5. Commissioning Source Variables

The CNA dataset included a commissioning source variable. Binary variables were created from this variable to indicate from which program each officer was commissioned. A detailed discussion of each of the commissioning programs can be found in Chapter II. The commissioning source variables are:

PLC: = 1 if officer commissioned via PLC, = 0 otherwise
OCC: = 1 if officer commissioned via OCC, = 0 otherwise
NROTC: = 1 if officer commissioned via NROTC, = 0 otherwise

MECEP: = 1 if officer commissioned via MECEP, = 0 otherwise
ECP: = 1 if officer commissioned via ECP, = 0 otherwise
MCP: = 1 if officer commissioned via MCP, = 0 otherwise
USNA: = 1 if officer commissioned via USNA, = 0 otherwise

The mean value of each commissioning source variable in the Table 3 represents the percentage of officers in our data from each commissioning source. Note that PLC and OCC commissions account for the majority of all officers in our data with 56% of officers being commissioned through these two programs. About 15% of new officers enter via NROTC, 11% via USNA, and 16% via enlisted commissioning programs.

6. The Prior Enlisted Marine Variable

We determined that the most accurate way to capture prior enlisted Marine service was from the commissioning source data, specifically from the Marine Corps' enlisted to officer commissioning programs. Though Armed Forces Active Duty Base Date and Pay Entry Base Date data were available in the TFDW dataset, there was no indication in this data that the officer's prior service was in the Marine Corps. Therefore, we created the prior enlisted Marine variable from the appropriate Marine Corps enlisted-to-officer commissioning source variables, ECP, MCP, and MECEP. This variable is also a binary variable, indicating that an officer either is a prior enlisted Marine (prior enlisted Marine = 1) or is not a prior enlisted Marine (prior enlisted Marine = 0). Using this definition, about 16.4% of new officers are prior enlisted Marines.

7. TBS Fiscal Year Variables

The CNA dataset included a TBS fiscal year variable. We created binary variables from this variable to indicate in which fiscal year the officer attended TBS. As shown in the descriptive statistics table, fiscal years 1999-2003 account for over 90% of the observations in the data. Most observations from 1998 were dropped from the dataset, as there were few officers who attended TBS during FY 1998 who also had an observed fitness report in the data from MMSB. Likewise, most officers who attended

TBS during FY 2004-2005 did not have observed fitness report scores in the FITREP data and were subsequently dropped from the dataset. Of these few officers from FY 1998 and FY 2004-2005 who have fitness reports, it's likely that they received observed FITREPS either because they were in very short training programs or they received observed fitness reports before they attended their primary MOS school.

8. Demographic Variables

The following demographic variables were created from variables that were included in the CNA dataset, except for the race variables, which were created from a race variable in the TFDW dataset. The CNA dataset had a race variable, but an appropriate entry for that variable was not available in the codebook for the CNA dataset. The race variable is defined based on TFDW information. All demographic variables are binary variables, with the exception of Age at First Commission, which is a continuous variable indicating the age, in years, of the officer at the time of first commissioning. The means for each demographic variable in Table 3 represent the percentage of officers in the data who are members of that demographic category.

Age at Commissioning:	Continuous. Values range from 19.75 to 35
Male:	= 1 if officer is male, = 0 otherwise
Female:	= 1 if officer is female, = 0 otherwise
White:	= 1 if officer is white, = 0 otherwise
Black:	= 1 if officer is black, = 0 otherwise
Other Race:	= 1 if officer is neither black nor white, = 0 otherwise
Single:	= 1 if officer is single, = 0 otherwise
Married:	= 1 if officer is married, = 0 otherwise
Divorced:	= 1 if officer is divorced, = 0 otherwise
Widowed:	= 1 if officer is widowed, = 0 otherwise
Separated:	= 1 if officer is separated, = 0 otherwise

Table 3 shows that the average age at commissioning is 24.75 years, that 83.2% of new officers are white, 9% are black or other, 91% are male, and 73% are single.

C. CROSS-TABULATIONS BY FISCAL YEARS, GENDER, AND RACE

1. Comparison of Means by Fiscal Year

A preliminary analysis of fitness report scores and the TBS performance variables based on a comparison of the means for each variable for each Fiscal Year will provide us with a general understanding of the nature of the data. Table 6 summarizes the dependent and key explanatory variables by entry cohort.

Table 6. Means of Key Variables by Fiscal Year

Variable	1998	1999	2000	2001	2002	2003	2004	2005
Observations	12	1212	1327	1244	1038	867	399	42
Average Cumulative Relative Value	-1.09594	3.524841	0.351019	0.259801	0.382172	0.167872	-0.41177	0.356666
Overall TBS Class Rank %	43.32639	49.22631	49.53305	50.03208	49.73257	49.91098	51.05184	55.03867
Academic Ranking %	42.65602	49.10576	NA	49.81854	49.42432	48.89643	49.08112	52.32549
Leadership Ranking %	37.01471	49.76074	NA	50.90308	50.72057	51.42943	53.1929	55.21649
Military Skills Ranking %	61.2935	49.67545	NA	49.84796	49.21755	48.33788	48.60127	53.20707

The mean values for all key TBS performance variables for the Fiscal Years 1999 to 2002 are all very close to 50.00. This is expected as nearly every member of these cohorts is included in the dataset. For those Fiscal Years in which only a small number of cohort members are included in the dataset, we see that the means for the TBS performance variables deviate more from 50.0. We also note that the mean for average cumulative relative value for FY99 is well above average at 3.52. We attribute this to the learning period that reporting seniors experienced as the new PES was introduced, and to a lack of understanding how reporting senior profiles and averages would be calculated. Because reporting seniors did not fully understand how their grading tendencies would be captured, many reporting seniors were still overstating performance in their fitness report evaluations.

2. Descriptive Statistics by Gender

In Table 7, we investigate raw differences in the key performance variables by gender. A preliminary analysis of means by gender may give an indication as to what effects might be expected in the multivariate models estimates.

Table 7. Descriptive Statistics by Gender

	Variable	Obs	Mean	Std. Dev.	Min	Max
Male	Avg Cum Rel Val	5598	0.1470071	4.095758	-10	10
	Overall Rank	5598	51.03602	28.72475	0	99.61539
	Acad Rank	4380	49.76776	28.77768	0	99.61539
	Ldrshp Rank	4380	52.09026	28.66367	0	100
	Mil Skills Rank	4380	50.60521	28.57166	0	100
Female	Avg Cum Rel Val	543	0.5134912	4.154155	-10	10
	Overall Rank	543	36.88648	26.77772	0	98.59155
	Acad Rank	434	44.9221	29.25967	0	97.64151
	Ldrshp Rank	434	38.48527	26.47681	0	97.10145
	Mil Skills Rank	434	36.69484	27.50071	0	99.59016

The mean value for average cumulative relative values for males is 0.15 while the mean for females is 0.51. This indicates that, on average, females have fitness report scores that are 0.36 points higher than males. However, mean values for every TBS performance variable are much higher for males than for females. For example, the mean leadership ranking for males in the sample is 52.09, and for females it is 38.49. Based on these means, on average males have leadership rankings that are over 11 points higher than females. This seeming contradiction in means indicates that, despite worse performance at TBS, females tend to perform better than males once they reach the Operating Forces.

3. Descriptive Statistics by Race

Just as descriptive statistics for gender were analyzed to provide clues to what effects might be expected when the multivariate models are estimated, we will also conduct a preliminary analysis of the race variables. North and Smith (1993) found that

performance varied systematically with race. Therefore, one might expect that black officers will have lower average fitness report scores, and lower rankings in the TBS performance variables. Table 8 contains the means of key variables by race.

Table 8. Descriptive Statistics by Race

	Variable	Obs	Mean	Std. Dev.	Min	Max
White & Other	Avg Cum Rel Val	5762	0.243741	4.079301	-10	10
	Overall Rank	5762	50.9212	28.62521	0	99.61539
	Acad Rank	4507	50.30655	28.75712	0	99.61539
	Ldrshp Rank	4507	51.56737	28.6408	0	100
	Mil Skills Rank	4507	50.49644	28.5278	0	100
Black	Avg Cum Rel Val	379	-0.798592	4.320915	-10	10
	Overall Rank	379	32.5094	26.46543	0	98.92473
	Acad Rank	307	35.00774	26.37445	0	98.3871
	Ldrshp Rank	307	40.53361	28.19179	0	99.12664
	Mil Skills Rank	307	32.53728	26.73935	0	99.17355

As the means for average cumulative relative values show for each group, black officers have average fitness report scores that are 1.04 points lower than officers of another race. We also note that the mean value for each TBS performance variable is lower for black officers than for white officers. Given the differences in these means, one would expect that the results of the multivariate models will find that black officers are lower performers in the Operating Forces unless there are other important factors that also differ by race.

4. Descriptive Statistics by TBS Fiscal Year

Table 9 below provides means of key variables by TBS fiscal year, or by cohort.

Table 9. Descriptive Statistics by TBS Fiscal Year

FY	Variable	Obs	Mean	Std Dev	Min	Max
98	Avg Cum Rel Val	12	-1.09594	3.608065	-6.14167	4.676667
	Overall Rank	12	43.32639	30.019	2.109703	94.92754
	Acad Rank	12	42.65602	31.68168	2.531647	95.78059
	Ldrshp Rank	12	37.01471	30.03622	5.439331	94.92754
	Mil Skills Rank	12	61.2935	32.47416	5.485229	96.73913

99	Avg Cum Rel Val	1212	-0.05528	3.524841	-10	10
	Overall Rank	1212	49.22631	28.71976	0	99.58678
	Acad Rank	1212	49.10576	28.76673	0	99.58678
	Ldrshp Rank	1212	49.76074	28.42645	0	99.58678
	Mil Skills Rank	1212	49.67545	28.77165	0	99.58678
00	Avg Cum Rel Val	1327	0.351019	3.750296	-10	10
	Overall Rank	1327	49.53305	28.92374	0	99.57983
	Acad Rank	0	NA	NA	NA	NA
	Ldrshp Rank	0	NA	NA	NA	NA
	Mil Skills Rank	0	NA	NA	NA	NA
01	Avg Cum Rel Val	1244	0.259801	4.003775	-10	10
	Overall Rank	1244	50.03208	28.7052	0	99.59514
	Acad Rank	1244	49.81854	28.64463	0	99.59016
	Ldrshp Rank	1244	50.90308	28.62004	0	99.59514
	Mil Skills Rank	1244	49.84796	28.58418	0	100
02	Avg Cum Rel Val	1038	0.382172	4.211754	-10	10
	Overall Rank	1038	49.73257	28.45681	0	99.61539
	Acad Rank	1038	49.42432	28.50649	0	99.61539
	Ldrshp Rank	1038	50.72057	28.66325	0	100
	Mil Skills Rank	1038	49.21755	28.40922	0	99.61539
03	Avg Cum Rel Val	867	0.167872	4.558695	-10	10
	Overall Rank	867	49.91098	29.44318	0	99.57627
	Acad Rank	867	48.89643	29.40975	0	99.57627
	Ldrshp Rank	867	51.42943	29.16498	0	99.57627
	Mil Skills Rank	867	48.33788	29.09411	0	99.57627
04	Avg Cum Rel Val	399	-0.41177	5.415968	-10	10
	Overall Rank	399	51.05184	29.24809	0	99.59016
	Acad Rank	399	49.08112	29.55551	0	99.59016
	Ldrshp Rank	399	53.1929	29.14275	0.409836	99.59016
	Mil Skills Rank	399	48.60127	29.42734	0	99.46524
05	Avg Cum Rel Val	42	0.356666	5.32504	-10	10
	Overall Rank	42	55.03867	26.9477	2.155174	98.27586
	Acad Rank	42	52.32549	28.17274	1.724136	98.53658
	Ldrshp Rank	42	55.21649	28.861	0.862068	99.56896
	Mil Skills Rank	42	53.20707	27.23558	11.21951	99.57265

Note how the number of observations by fiscal year begins to decline as the data progress toward the end of the observation period. The closer an officer's commissioning date is to the end of the observation period, the less time that officer had to receive an observed fitness report. Hence, the number of observations becomes smaller the closer the FY is to the end of the observation period. Also, note that only 12 officers from the TBS FY98 cohort are included in the dataset. Members of this FY cohort did not have enough time to have an observed report recorded before the beginning of the observation period.

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V. PERFORMANCE MODELS AND HYPOTHESIZED EFFECTS

A. PERFORMANCE MODELS

1. Performance model #1. Independent Variables: The three areas of TBS performance, other-than-top-three MOS preference, commissioning sources

The primary performance model was specified so as to analyze the effect of the three areas of evaluation at TBS on later performance. Other key explanatory variables include the other-than-top-3-MOS preference variable which demonstrates the effect on performance of an officer not receiving an MOS that was in his top three MOS preferences.

Model #1 is specified as:

> Average Cumulative Relative Value = f (Academic Rank, Leadership Rank, Military Skills Rank, Other MOS, Female, OCC, NROTC, MECEP, ECP, USNA, MCP, Age at First Commission, Black, Other Race, Married, Divorced, Widowed)

Table 10 indicates the hypothesized effects of selected explanatory variables in the model. A plus sign indicates an expected positive effect on average cumulative relative value of Fitness Report scores, and a minus sign indicates an expected negative effect. The first column identifies the reference category for each group (e.g. the reference group for race is white). We indicate our hypothesized effects of these explanatory variables as they relate to the reference group and with all other explanatory variables held constant.

Table 10. Hypothesized Effect of Explanatory Variables

Hypothesized effects of Explanatory Variables on Average Cumulative Relative Values		
Reference Group	**Explanatory Variable**	**Effect**
	Academic Ranking	+
	Leadership Ranking	+
	Military Skills Ranking	+
	Top Third	+
Middle Third		NA
	Bottom Third	-
Top 3 MOS		NA
	Other than top 3 MOS	-
Male		NA
	Female	-
PLC		NA
	OCC	-
	NROTC	+
	MECEP	+
	ECP	+
	USNA	+
	MCP	+
Non-prior enlisted Marine		NA
	Prior enlisted Marine	+
	Age at First Commission	-
White		NA
	Black	-
	Other Race	-
Single		NA
	Married	+
	Divorced	+

We expect that each of the three areas of TBS performance will have a positive predictive effect on later performance. That is to say that the higher a student's rank is in each of the three areas of evaluation, the higher we expect the average cumulative relative value of the officer's Fitness Reports. The rationale is that the skills that are being evaluated at The Basic School will also be the skills that will translate into better performance in the operating forces. Of these, we expect that the leadership ranking will have the greatest predictive properties. This means that we hypothesize that the estimated coefficient obtained for the leadership ranking will predict the greatest positive

change in average cumulative relative value FITREP scores (i.e., have the largest magnitude of the three TBS performance variables). This hypothesized effect is due to the nature of the leadership evaluation at TBS, where the officer's leadership skills and acumen are evaluated by an experienced captain, the Staff Platoon Commander, who should possess the judgment and ability to discern and judge the level of the characteristics and traits that determine performance of junior officers in the operating forces. We believe that Staff Platoon Commanders do an excellent job of making this evaluation; therefore, we expect the leadership ranking to be strongly predictive of future performance.

We also expect academics and military skills to be predictive of later officer performance, but not as strongly as leadership skills. Further, we expect that academics will be more predictive of later performance than military skills. Ergun found the TBS class rank is associated with better performance in the operating forces as indicated by promotion, retention, and PI score. Furthermore, he found that academic and military skills scores at TBS were highly correlated to overall performance at TBS. Other studies have used SAT scores or GCT scores as proxies for aptitude and found that aptitude is a significant predictor of performance. North and Smith converted GCT scores to EL scores and found these scores to be highly correlated with performance at TBS. Therefore, we believe that academic scores are closely tied to GCT scores and since GCT scores are significant predictors of future performance, academic scores at TBS will be more predictive of future performance than military skills.

An officer who does not receive an MOS that is among his top three MOS preferences is expected to have significantly lower average cumulative Fitness Report scores than the officer who does receive an MOS in his top-three preference list. This hypothesized effect is due to the satisfaction attained when one is awarded his or her MOS of choice. The officer should be happier, and thereby more effective and productive, when assigned an MOS that is higher on that officer's list of preferences.

We hypothesize that all commissioning sources, particularly those that are enlisted-to-commissioning sources, will have higher average cumulative relative values than PLC, with the exception of OCC. Previous studies have found TBS scores of OCC

graduates to be lower than those of other commissioning sources (Ergun, 2003). We therefore hypothesize that this performance difference at TBS will carry over into performance in the operating forces.

For the demographic variables, we expect that females, blacks, and members of races other than black or white will all have lower average cumulative fitness report scores than male officers and white officers, respectively. We hypothesize this effect based on the previous findings of North and Smith (1993). This study found that there was a performance gap between minority and majority officer candidates at OCS and minority and majority officers at TBS. Minority male officers were 8 percentage points less likely than whites to complete OCS and at TBS African-American officers had a class rank percentile 22 points below whites. The raw data that North and Smith gathered also indicated that women have 20 percentage point higher OCS and pre-commissioning attrition than men. Therefore, we believe that the attrition and performance trends at OCS and TBS will continue throughout an officer's career and will impact fitness report scores. Also, we expect that as one gets older and more mature, performance in the Operating Forces will improve and thus average cumulative relative values will be higher for older officers relative to the performance of younger officers. Lastly, we expect that married and divorced officers will have higher cumulative relative values than those of single officers due to an increased maturity level that comes with either having a family, or having gone through a marriage and divorce.

2. Performance Model #2. Independent variables: The three areas of TBS performance, other-than-top-3 MOS preference, prior enlisted Marine

This model is specified as:

> Average Cumulative Relative Value = f (Academic Rank, Leadership Rank, Military Skills Rank, Other MOS, Female, Prior Enlisted Marine, Age at First Commission, Black, Other Race, Married, Divorced, Widowed)

In Model #2, commissioning sources are eliminated so that we can introduce the Prior Enlisted Marine variable into the model, and thereby capture the effect on

performance of prior enlisted Marine experience. The prior enlisted Marine variable is created from three of the commissioning source variables (ECP, MECEP, MCP), and, therefore, poses a collinearity problem that must be avoided by removing the commissioning source variables from this model. We expect that prior enlisted Marine experience will have a positive effect on average cumulative relative values, and that all other explanatory variables in the model will retain the same hypothesized effects as above. This hypothesis is based on the intuition that officers with prior Marine experience will have greater success due to an understanding of the organization, and experience dealing with the interpersonal and organizational problems inherent in the organization. Previous studies have also found that prior enlisted Marine experience is predictive of better performance at TBS (Finley, 2002) and we expect that better performance at TBS will carry over to better performance in the operating forces.

3. Performance Model #3. Independent variables: TBS performance in thirds, other-than-top-three MOS preference, commissioning sources

This model is specified as:

> Average Cumulative Relative Value = f (Top Third Performer, Bottom Third Performer, Other MOS, Female, OCC, NROTC, MECEP, ECP, USNA, MCP, Age at First Commission, Black, Other Race, Married, Divorced, Widowed)

In Model #3, to capture the effect of the officer's placement in the system of thirds, we eliminate Academics, Military Skills, and Leadership rankings from the model and introduce variables for Top Third and Bottom Third. Collinearity exists between the "thirds" variables and the TBS performance variables, as placement in the thirds is determined by class ranking, which is determined by the three areas of evaluation. Middle third is excluded because being a member of the Middle third is part of the reference group's profile, as depicted in Table 10.

Again, we hypothesize that the effect of the other variables in the model will remain the same as in Model #1 or Model #2 above; however, we expect that a top third

performer will have higher average cumulative relative values, and conversely, a bottom third performer will have lower average cumulative relative values, as compared to those in the middle third.

4. Performance Model #4. Independent variables: TBS performance in thirds, other-than-top-3 MOS preference, prior enlisted Marine

This model is specified as:

Average Cumulative Relative Value = f (Top Third Performer, Bottom Third Performer, Other MOS, Female, Prior Enlisted Marine, Age at First Commission, Black, Other Race, Married, Divorced, Widowed)

In this specification, commissioning sources are replaced by the prior enlisted Marine variable. This model will be used to note any differences between the effect of prior enlisted Marine experience in models that include the three areas of TBS performance, and this model in which we are examining the effect in the system of thirds. We still expect that prior enlisted Marine experience will have a positive effect on average cumulative fitness report scores, and that the other hypothesized effects for the remaining explanatory variables in the model will remain the same.

5. Performance Model #5. Independent variables: TBS final overall class ranking, other-than-top-3 MOS preference, commissioning sources

This model is specified as:

Average Cumulative Relative Value = f (Final Overall Class Rank, Other MOS, Female, OCC, NROTC, MECEP, ECP, USNA, MCP, Age at First Commission, Black, Other Race, Married, Divorced, Widowed)

In this model, final overall class rank now becomes the primary explanatory variable, replacing TBS performance in thirds. The effect of TBS final overall class rank is hypothesized to be positive. We expect that final overall class rank will have an effect that is slightly larger than the effect of the leadership ranking, as the overall class ranking is determined by the three areas of evaluation, of which leadership makes up the largest percentage.

6. Performance Model #6. Independent variables: TBS final overall class ranking, other-than-top-3 MOS preference, prior enlisted Marine

This model is specified as:

Average Cumulative Relative Value = f (Final Overall Class Rank, Other MOS, Female, Prior Enlisted Marine, Age at First Commission, Black, Other Race, Married, Divorced, Widowed)

In this model, we introduce the prior enlisted Marine variable in place of the commissioning source variables. This will allow us to evaluate any changes in the effect of prior enlisted Marine experience when evaluating the effect of final overall TBS class ranking instead of the three areas of evaluation or placement in the system of thirds.

B. SECONDARY MODEL

The purpose of this secondary model is to evaluate any change in the effects of TBS performance on junior officers over time. As discussed in Chapter IV, and shown in Table 5, fitness report data from MMSB included information on each fitness report, to include the rank of the Marine Reported On for each report. To evaluate whether the effects of performance at TBS change over an officer's career, for example whether the effect of the leadership ranking begins to fade as an officer becomes further removed from The Basic School, we specified three separate models and compared the coefficients of the TBS performance variables in each model. These models were specified just as Performance Model #1 is specified, but models are estimated for average cumulative relative value separately for second lieutenants, for first lieutenants, and for captains.

C. CHAPTER SUMMARY

The chapter provides the model specifications and the intent of each specification for the 6 performance models used in this analysis. Our hypothesized effects are based upon findings of previous research, as well as our experience, intuition, and understanding of officer performance at TBS, and officer performance in the operating forces. We also describe a secondary model that is used to evaluate changes in the

effects of the explanatory variables over time. Last, we provide the characteristics of the reference group which provides the baseline from which to measure the magnitude of the effect of an explanatory variable, holding all other variables constant.

VI. MULTIVARIATE MODEL RESULTS

A. PRIMARY PERFORMANCE MODEL RESULTS

1. Performance Model #1. Independent Variables: The Three Areas of TBS Performance, Other-Than-Top-Three MOS Preference, Commissioning Sources

The dependent variable in this model is the average cumulative relative value derived from fitness reports. The coefficients of the explanatory variables will demonstrate the effect that the explanatory variables have on average cumulative relative value, in points. Results of estimating this multivariate model are presented in Table 7 Column 1 is the list of explanatory variables included in the model specification. Column 2 lists the coefficients and standard errors for each of the corresponding variables in Column 1. The data used in estimating the coefficients in Column 2 included contract aviators (the unrestricted dataset). Column 3 lists the coefficients and standard errors for each of the corresponding variables in Column 1, and only data on ground assignable officers was used in estimating the coefficients in Column 3 (the restricted dataset).

The F-statistics for the unrestricted and restricted versions of Model #1 are 49.14 and 48.02, respectively, with corresponding P-values of 0.0000 for both. Therefore, we are confident that are model's coefficients are jointly significant, and that the model's results are reliable. The r-squared values for the unrestricted and restricted models are 0.15 and 0.17, respectively. This tells us that we are capturing roughly 15-17% of those observable and measurable things that determine future performance. Since we are capturing only 15-17% of these factors, there are likely many other factors that we are not capturing in our data, or that cannot be observed and measured, that are also predictive of future performance.

Table 11. Ordinary Least Squares Estimates of Average Cumulative Relative Value

	Sample=All PMOS	Sample=Ground Assignables
Academics class rank - percent	0.00775	0.01000
	(0.00252)***	(0.00273)***
Leadership class rank - percent	0.04545	0.04692
	(0.00239)***	(0.00261)***
Mil Skills class rank - percent	-0.00011	-0.00026
	(0.00262)	(0.00286)
MOS not in top 3 prefs rcvd	-0.07475	-0.22336
	(0.12678)	(0.13177)*
Female officer	1.24943	1.16402
	(0.20287)***	(0.21033)***
OCC commission	0.29722	0.51342
	(0.15970)*	(0.17668)***
NROTC commission	0.42193	0.39746
	(0.18365)**	(0.20010)**
MECEP commission	0.85587	1.01122
	(0.24384)***	(0.26200)***
ECP commission	0.57109	0.72515
	(0.32471)*	(0.33885)**
Naval Academy commission	0.52349	0.67838
	(0.20321)**	(0.22637)***
MCP commission	0.74770	0.84518
	(0.43664)*	(0.45223)*
Age when commissioned	-0.01858	-0.03208
	(0.02861)	(0.03081)
Race Black	-0.66571	-0.78702
	(0.23717)***	(0.24624)***
Race all others	0.04959	0.01681
	(0.33052)	(0.34056)
Married at 1st record	0.81555	0.88488
	(0.16239)***	(0.17556)***
Divorced at 1st record	0.81511	0.70552
	(0.43339)*	(0.46263)
Widowed at 1st record	1.28976	1.15985
	(3.87895)	(3.85759)
Constant	-2.70347	-2.47660
	(0.68890)***	(0.74211)***
Observations	4757	3956
R-squared	0.15	0.17
Standard errors in parentheses	F(17, 4739) = 49.14 Prob > F = 0.0000	F(17, 3938) = 48.02 Prob > F = 0.0000
* significant at 10%	** significant at 5%	*** significant at 1%

a. Effects of the TBS Performance Variables

TBS performance variables are expressed in ranking percentage; therefore, the interpretation of the coefficients of the TBS performance variables is the effect of a one percentage point change in TBS performance on average cumulative fitness report scores. For example, the coefficient of Academic Ranking in the unrestricted model is .00775; therefore, we interpret that coefficient to mean that a 1 point increase in academic ranking predicts a .00775 point increase in average cumulative relative value, evaluated at the mean value of the average cumulative relative value. These effects are expected, holding all other explanatory variables constant.

Academic ranking has a small practical significance and predicts a very small change in average relative cumulative value, evaluated at the mean, for a relatively large change in academic ranking. For example, if an officer were to improve his academic ranking from last in his TBS company to first in his TBS company, that would predict a 0.775 point increase in average cumulative relative value in the unrestricted model, and a 1.0 point increase in average relative cumulative value in the restricted model, all else equal. Because we evaluate this change at the mean value of the average cumulative relative value, we would expect the mean value of average cumulative relative value to increase from 90.179 (the baseline mean) to 90.854.

Leadership ranking has a coefficient that is four and a half times greater than that of the academic ranking and is also statistically significant at the 1% level. For every 1 point increase in leadership ranking, we expect a 0.045 point increase in average cumulative relative value, evaluated at the mean. The officer who increases his leadership ranking from last in his TBS company to first in his TBS company would expect average cumulative relative values that are 4.5 points greater in the unrestricted model, and nearly 4.7 points greater in the restricted model, all other variables held constant. Perhaps, more realistically, we can compare two officers who are identical (i.e. members of the reference group, with the exception of their leadership rankings). Officer A has a leadership ranking that is 50% lower than Officer B's leadership ranking. Our model predicts that Officer B's average cumulative relative value would be 2.5 points

higher than Officer A's average cumulative relative value. Again, as these effects are measured at the mean value of the average cumulative relative value, we would expect that Officer B's average cumulative relative value to be 92.679 (90.179 + 2.5).

The military skills ranking variable was not statistically significant at any level, and, therefore, is considered to be no different from zero. That is to say that military skills ranking has no effect on average cumulative relative values.

b. Effect of the MOS Preference Received Variable

In the unrestricted model, Column 2 of Table 7 receiving an MOS not in the officer's top three MOS preferences was not statistically significant at any level and, therefore, cannot be said to have any effect on average cumulative relative value. However, when contract aviators are removed from the sample and we estimate the model in Column 3 restricted to a sample of ground assignable officers, the other-than-top-3 MOS preference variable becomes significant at the 10% level. As this is a binary variable, meaning an officer did or did not get assigned an MOS in his top 3 MOS preferences, the coefficient of the variable is its predicted effect, all else held constant. Therefore, the effect of this variable in the restricted model is -0.22. The interpretation of this coefficient is that, holding all other explanatory variables constant, an officer who is assigned an MOS that is not in his top 3 MOS preferences is expected to have an average cumulative relative value that is 0.22 points lower than the officer who was assigned a top 3 MOS preference. Thus, at the mean value of average cumulative relative value, this officer's value would drop from 90.179 to 89.959.

We believe that this variable is not statistically significant in the unrestricted model due to the fact that contract aviators are included in that data, and contract aviators must be considered to have received their first MOS choice. Ground assignable officers who are higher in their respective third will more than likely be assigned higher MOS preferences and, therefore, will be expected to be better performers in the operating forces, since they are better performers at TBS. This is not true of contract aviators, as they are no more or less likely to be "assigned" their top MOS

preference, regardless where they rank in the system of thirds, or where they rank lineally in the company. In effect, the effect on future performance of being assigned a top MOS preference is masked for contract aviators.

Though this variable in the restricted model has the expected negative coefficient, it is a surprise that the effect is not greater. Our hypothesis was that not being assigned an MOS in the top 3 MOS preferences would reduce performance in the operating forces due to job dissatisfaction. After all, this would be an officer who was ostensibly working in a job that he didn't really want at all.

c. Effects of Commissioning Source Variables

Relative to the PLC commissioning source, and holding all other explanatory variables constant, we see that all other commissioning sources predict higher average cumulative relative values. In the unrestricted model, the enlisted-to-officer commissioning sources (ECP, MCP, MECEP) have the largest effects. ECP is statistically significant at the 10% level, and has a coefficient of 0.57. All else constant, we expect an officer commissioned via ECP to have average cumulative relative values that are 0.57 points higher than PLC. MCP predicts a 0.75 point increase in average cumulative relative value than PLC (statistically significant at the 10% level), and MECEP predicts a 0.86 point higher score than PLC (statistically significant at the 1% level).

An officer commissioned via the Naval Academy is predicted to have average cumulative relative values that are 0.52 points higher than PLC. This result is significant at the 5% level. The next largest effect is predicted by NROTC at a positive 0.42 point difference, followed by OCC with a predicted +0.30 difference. The positive coefficient of OCC is surprising, given that a previous study demonstrated that officers commissioned via OCC perform more poorly at TBS than officers who are commissioned via PLC (Ergun, 2003.) In fact, Ergun demonstrated that officers commissioned via OCC have the worst TBS performance of all commissioning sources. Perhaps those

commissioned via OCC perform better in the Operating Forces because they are generally older and have more life and work experience than officers commissioned via PLC.

The positive coefficients for the enlisted-to-officer commissioning sources are certainly expected. There is a demonstrated benefit to understanding the organization, the culture, and the language. Also, the prior enlisted Marine officer is seen as credible by enlisted Marines. We believe enlisted Marines have more respect for officers who were once enlisted Marines themselves. We believe the experience that these Marine officers possess also makes them more effective once they reach the operating forces.

It is also expected that Naval Academy and NROTC officers would have higher average cumulative relative values than PLC and OCC officers. The Naval Academy requires that Marine option Midshipmen attend various Marine Corps specific training events, specifically the Leatherneck program that is executed at The Basic School. Naval Academy graduates are also accustomed to the regimented and disciplined lifestyle of the military. NROTC officers have the benefit of some military acculturation through the classes and drills that are part of the NROTC program. They are, in essence, being acclimatized to the military and to the Marine Corps by active duty Marines on each respective NROTC staff. By contrast, the only Marine Corps experience that an officer commissioned via OCC or PLC has is the experience of OCS, TBS, and then the follow-on MOS school.

In the restricted model in Column 3 of Table 7 we observe that the estimated coefficients become larger, with the exception of NROTC. We also observe that three of the six commissioning source variables have a higher level of statistical significance. Again, it appears that the effect of including contract aviators in the model is to mask some of the effect of commissioning sources on average cumulative relative values.

d. Effects of the Gender

The largest observed effect of all the binary demographic characteristics is for the variable "female." This variable has a coefficient of 1.25 in the unrestricted model in Column 2, and a coefficient of 1.16 in the restricted model in Column 3. This variable is significant at the 1% level for both models. This implies that, all else equal, being female will increase the average FITREP score by 1.16 to 1.25 points. Thus, at the mean, average cumulative relative value for a female officer would be 91.425 compared to 90.179 for a male officer. This result is somewhat surprising both in the magnitude of the effect and in the fact that it is positive.

This study does not address why females have higher average FITREP scores than males, but several possibilities could be examined. Perhaps this effect is a function of some unobservable characteristics that are associated with female officers who are commissioned via the PLC program, or perhaps young female officers are more mature than their male counterparts and perform at a higher level when on the job. Another explanation may be that females are concentrated in MOSs that have higher average fitrep scores for all officers in those MOSs.

e. Effects of the Race Variables

The variable "black" has a coefficient of -0.67 in the unrestricted model and a coefficient of -0.79 in the restricted model; therefore, if an officer has all the attributes of the reference group, but is black instead of white, that officer is expected to have average FITREP scores that are -0.67 to -0.79 points lower than his white counterpart. Thus, when evaluated at the mean, the black officer would have an average cumulative relative value that is 90.179 – 0.67, or 89.509. The variable "otherrace," which is the variable that denotes an officer who is neither black or white, was not statistically significant at any level in either model. Again, this study does not analyze why black officers have lower FITREP scores than white officers, but one could explore several possibilities. This effect could again be a function of unobservable characteristics unique to black officer who are commissioned via the PLC program, or it could also be an MOS specific effect. There may also be demographic differences that account for this effect.

f. Effects of Marital Status Variables

The coefficient for the variable "married" is 0.82 in the unrestricted model and 0.88 in the restricted model. This indicates that married officers are expected to have FITREP scores that are 0.82 to 0.88 points higher than the reference group, all else constant. This variable is significant at the 1% level in both models. Thus, the married officer is expected to have an average cumulative relative value that is 90.179 + 0.82, or 90.999.

This result is not surprising, as one would expect a married officer to have a greater incentive to be a higher performer than his single counterpart. Married officers are generally older, more mature, have people who depend on them to succeed, and are more adept at dealing with interpersonal conflicts due to their marriage experience. The coefficient for the variable "divorced" was only statistically significant in the all unrestricted model, and was significant at the 10% level. Its coefficient is 0.82, indicating that divorced officers are expected to have higher average FITREP scores than the reference group, all else constant.

Again, one can look to the maturity and experience level of those who have been through a marriage and subsequently divorced. Many of these officers also have the incentive of people depending on them as well, as many divorced officers are still responsible for providing monetary support to children.

2. Performance Model #2. Independent Variables: The Three Areas of TBS Performance, Other-Than-Top-3 MOS Preference, Prior Enlisted Marine

The dependent variable in this model remains the average cumulative relative value derived from the fitness reports. The major change in the specification of this model is that the commissioning source variables have been replaced by the prior enlisted Marine variable. As the prior enlisted variable is created from the ECP, MCP, and MECEP variables, to include the prior enlisted variable in the previous model specification would create a collinearity problem. Results of estimating this multivariate

model are depicted in Table 8. Column 1 is the list of explanatory variables included in the model specification. Column 2 lists the coefficients and standard errors for each of the corresponding variables in Column 1. The data used in estimating the coefficients in Column 2 included contract aviators (the unrestricted dataset). Column 3 lists the coefficients and standard errors for each of the corresponding variables in Column 1, and only data on ground assignable officers was used in estimating the coefficients in Column 3 (the restricted dataset).

The F-statistics for the unrestricted and restricted versions of Model #2 are 68.69 and 66.67, respectively, with corresponding P-values of 0.0000 for both. Therefore, we are confident that are model's coefficients are jointly significant, and that the model's results are reliable. The r-squared values for the unrestricted and restricted models are 0.15 and 0.17, respectively. This tells us that we are capturing roughly 15-17% of those observable and measurable things that determine future performance. Since we are capturing only 15-17% of these factors, there are likely many other factors that we are not capturing in our data, or that cannot be observed and measured, that are also predictive of future performance.

Table 12. Ordinary Least Squares Estimates of Average Cumulative Relative Value

	Sample=All PMOS	Sample=Ground Assignables
Academics class rank - percent	0.00815	0.01034
	(0.00251)***	(0.00273)***
Leadership class rank - percent	0.04555	0.04680
	(0.00238)***	(0.00260)***
Mil Skills class rank - percent	0.00015	-0.00004
	(0.00261)	(0.00285)
MOS not in top 3 prefs rcvd	-0.08303	-0.23742
	(0.12678)	(0.13180)*
Female officer	1.32586	1.24841
	(0.20122)***	(0.20841)***
Prior Enlisted - from ECP,MCP,MECEP	0.55051	0.55429
	(0.19542)***	(0.20818)***
Age when commissioned	-0.02310	-0.02104
	(0.02523)	(0.02725)
Race Black	-0.65890	-0.79033
	(0.23688)***	(0.24603)***
Race all others	0.03732	0.01169
	(0.33042)	(0.34049)
Married at 1st record	0.78531	0.83428
	(0.16138)***	(0.17458)***
Divorced at 1st record	0.80356	0.68188
	(0.43158)*	(0.46090)
Widowed at 1st record	1.38441	1.26331
	(3.88096)	(3.86203)
Constant	-2.38081	-2.41409
	(0.62509)***	(0.67514)***
Observations	4757	3956
R-squared	0.15	0.17
Standard errors in parentheses	F(12, 4744) = 68.69 Prob > F = 0.0000	F(12, 3943) = 66.67 Prob > F = 0.0000
* significant at 10%	** significant at 5%	*** significant at 1%

a. Effect of the Prior Enlisted Marine Variable

The Prior Enlisted variable is significant at the 1% level in both models, and its coefficient is positive. The coefficient of the prior enlisted variable predicts that, all else constant, an officer who was formerly an enlisted Marine would have average FITREP scores that are 0.55 points higher than his non-prior enlisted Marine counterparts. This result is not surprising given the coefficients from the previous model for ECP, MCP, and MECEP were all statistically significant and positive. In effect, this coefficient simply reflects the weighted average of the coefficients of MECEP, ECP, and MCP in Model #1.

b. Effects of the Remaining Explanatory Variables

A comparison of the coefficients that are held over from the previous model reveal that there are no substantial changes in the significance or magnitude of the variables from this model to the previous model.

3. Performance Model #3. Independent Variables: TBS Performance in Thirds, Other-Than-Top-Three MOS Preference, Commissioning Sources

The dependent variable in this model is still the average cumulative relative derived from the fitness reports. The TBS performance variables (leadership rank, military skills rank, and academics rank) are replaced by the variables that signify an officer's standing in the system of thirds. The reference group specification is that the officer is in the middle third; therefore, membership in the top or bottom third is depicted by binary variables for being in the top third or the bottom third. The TBS performance variables cannot be included in the same model as the dummy variables for the officers standing in the system of thirds because the officer's standing in the system of thirds is determined by the overall grade point average, which is a composite of the three areas of evaluation. The results of estimating this multivariate model are depicted in Table 13. Column 1 is the list of explanatory variables included in the model specification. Column 2 lists the coefficients and standard errors for each of the corresponding

variables in Column 1. The data used in estimating the coefficients in Column 2 included contract aviators (the unrestricted dataset). Column 3 lists the coefficients and standard errors for each of the corresponding variables in Column 1, and only data on ground assignable officers was used in estimating the coefficients in Column 3 (the restricted dataset).

The F-statistics for the unrestricted and restricted versions of Model #3 are 51.42 and 50.37, respectively, with corresponding P-values of 0.0000 for both. Therefore, we are confident that the model's coefficients are jointly significant, and that the model's results are reliable. The r-squared values for the unrestricted and restricted models are 0.12 and 0.14, respectively. This tells us that we are capturing roughly 12-14% of those observable and measurable things that determine future performance. Since we are capturing only 12-14% of these factors, there are likely many other factors that we are not capturing in our data, or that cannot be observed and measured, that are also predictive of future performance.

Table 13. Ordinary Least Squares Estimates of Average Cumulative Relative Value

	Sample=All PMOS	Sample=Ground Assignables
Top Third	1.03101	1.17010
	(0.12577)***	(0.14059)***
Bottom Third	-1.76545	-1.84852
	(0.12425)***	(0.13554)***
MOS not in top 3 prefs rcvd	0.07068	-0.20988
	(0.10325)	(0.11037)*
Female officer	0.94883	0.83736
	(0.18040)***	(0.18834)***
OCC commission	0.25676	0.41660
	(0.14169)*	(0.15771)***
NROTC commission	0.53667	0.53465
	(0.16254)***	(0.17841)***
MECEP commission	1.30069	1.36789
	(0.21674)***	(0.23458)***
ECP commission	0.58289	0.62355
	(0.28606)**	(0.29980)**
USNA commission	0.69122	0.84516
	(0.17958)***	(0.20225)***
MCP commission	1.22204	1.29220
	(0.38593)***	(0.40152)***
Age when commissioned	-0.02857	-0.04065
	(0.02559)	(0.02766)

Race Black	-0.64997	-0.75132
	(0.21244)***	(0.22162)***
Race all others	-0.09439	-0.16720
	(0.29228)	(0.30407)
Married at 1st record	0.81583	0.89925
	(0.14246)***	(0.15552)***
Divorced at 1st record	0.97103	0.82681
	(0.37605)***	(0.39974)**
Widowed at 1st record	1.15399	0.93737
	(3.86231)	(3.85183)
Constant	0.42704	0.93421
	(0.60958)	(0.65978)
Observations	5976	4929
R-squared	0.12	0.14
Standard errors in parentheses	F(16, 5959) = 51.42 Prob > F = 0.0000	F(16, 4912) = 50.37 Prob > F = 0.0000
* significant at 10%	** significant at 5%	*** significant at 1%

a. Effects of the Placement in the System of Thirds

The bottom third and top third variables are statistically significant in both models at the 1% level. The coefficient for the top third variable is 1.03 for the all PMOS model and 1.17 for the model restricted to ground assignable officers. The model predicts that an officer who finishes TBS in the top third of his company will receive higher average FITREP scores than the officer who finishes TBS in the middle third, all other variables held constant. The model also predicts that the officer who finishes in the bottom third of his TBS class will receive average FITREP scores that are substantially lower than the middle third officer. The coefficient for bottom third is -1.77 for the unrestricted model and -1.85 for the restricted model. When we calculate the total difference in coefficients for top third and bottom third, we see that the difference in predicted average FITREP scores between an officer who finishes in the top third of his TBS class and an officer who finishes in the bottom third of his TBS class is nearly 3 points.

Of course, these coefficients are not surprising given that an officer's standing in the system of thirds is determined by his overall TBS class standing percentage, which is a composite of that officer's leadership, academics, and military

skills grades. However, what is noteworthy about these coefficients is that these results make the case that the quality spread based on TBS performance does indeed provide a relatively equal distribution of higher performing, average performing, and lower performing officers to each ground assignable MOS, based on performance in the Operating Forces. This is the stated goal of the quality spread.

b. Changes in Effects of Other Significant Variables

The coefficient for the female variable has decreased by approximately 0.3 points when compared to the first model specification in which the TBS performance variables were used instead of the thirds variables. This suggests that the effect of the thirds accounts for some of the effect of gender. This may indicate that there is a relationship between an officer being female and how that officer will finish in the system of thirds.

Most commissioning source variables coefficients have increased in size in this model when compared to the first model. Those commissioning sources that are associated with Marine Corps or military experience had the most dramatic increases. For example, in the previous model the coefficient for MECEP was 0.86 for the all PMOS model and 1.01 for the ground assignable model. However, in this model those coefficients increase to 1.30 and 1.37, respectively. This suggests that an officer's ranking in leadership, academics, and military skills accounts for more of the effect of having Marine Corps experience than does an officer's standing in the system of thirds. Other statistically significant variables had little change in their coefficients in this model.

4. Performance Model #4. Independent Variables: TBS Performance in Thirds, Other-Than-Top-3 MOS Preference, Prior Enlisted Marine

This model examines the effects of prior enlisted experience, and an officer's standing in the system of thirds. Again, commissioning source variables are omitted due to collinearity with the prior enlisted variable, and TBS performance variables are omitted so that the thirds variables can be estimated. The results of estimating this

multivariate model are depicted in Table 14. Column 1 is the list of explanatory variables included in the model specification. Column 2 lists the coefficients and standard errors for each of the corresponding variables in Column 1. The data used in estimating the coefficients in Column 2 included contract aviators (the unrestricted dataset). Column 3 lists the coefficients and standard errors for each of the corresponding variables in Column 1, and only data on ground assignable officers was used in estimating the coefficients in Column 3 (the restricted dataset).

The F-statistics for the unrestricted and restricted versions of Model #4 are 72.25 and 70.46, respectively, with corresponding P-values of 0.0000 for both. Therefore, we are confident that the model's coefficients are jointly significant, and that the model's results are reliable. The r-squared values for the unrestricted and restricted models are 0.12 and 0.14, respectively. This tells us that we are capturing roughly 12-14% of those observable and measurable things that determine future performance. Since we are capturing only 12-14% of these factors, there are likely many other factors that we are not capturing in our data, or that cannot be observed and measured, that are also predictive of future performance.

Table 14. Ordinary Least Squares Estimates of Average Cumulative Relative Value

	Sample=All PMOS	Sample=Ground Assignables
Top Third	1.08205	1.21780
	(0.12532)***	(0.14015)***
Bottom Third	-1.78946	-1.86477
	(0.12410)***	(0.13537)***
MOS not in top 3 prefs rcvd	0.05905	-0.22509
	(0.10336)	(0.11056)**
Female officer	1.05375	0.95690
	(0.17933)***	(0.18705)***
Prior Enlisted - from ECP,MCP,MECEP	0.89390	0.83414
	(0.17205)***	(0.18411)***
Age when commissioned	-0.04819	-0.04944
	(0.02264)**	(0.02453)**
Race Black	-0.62217	-0.72566
	(0.21245)***	(0.22170)***
Race all others	-0.12312	-0.19255
	(0.29237)	(0.30416)
Married at 1st record	0.80599	0.87413
	(0.14186)***	(0.15500)***
Divorced at 1st record	1.00617	0.84736
	(0.37484)***	(0.39862)**
Widowed at 1st record	1.28809	1.07570
	(3.86875)	(3.86047)
Constant	1.17050	1.49615
	(0.54411)**	(0.59060)**
Observations	5976	4929
R-squared	0.12	0.14
Standard errors in parentheses	F(11, 5964) = 72.25 Prob > F = 0.0000	F(11, 4917) = 70.46 Prob > F = 0.0000
* significant at 10%	** significant at 5%	*** significant at 1%

a. Effects of Prior Enlisted Marine

When estimated in this model, we see that the effect of prior enlisted Marine experience is nearly 0.3 points greater than when estimated in Model #2 which used TBS performance variables rather than position in the thirds. These results are congruent with the results of the commissioning source variables in the previous model. Again, the data suggest that the TBS performance variables are capturing more of the prior enlisted Marine effect than the thirds variables are capturing. This also suggests

that prior enlisted Marine experience may be more predictive of an officer's performance in the three areas of evaluation at TBS than it is in predicting where that officer will finish in the system of thirds.

b. Changes in Effects of Other Significant Variables

The other statistically significant independent variables had little change in their coefficients in this model.

5. Performance Model #5. Independent Variables: TBS Final Overall Class Ranking, Other-Than-Top-3 MOS Preference, Commissioning Sources

This model examines the effect of the officer's final overall class ranking. The TBS performance variables and the thirds variables are replaced by the final overall class ranking variable. The results of estimating this multivariate model are depicted in Table 15. Column 1 is the list of explanatory variables included in the model specification. Column 2 lists the coefficients and standard errors for each of the corresponding variables in Column 1. The data used in estimating the coefficients in Column 2 included contract aviators (the unrestricted dataset). Column 3 lists the coefficients and standard errors for each of the corresponding variables in Column 1, and only data on ground assignable officers was used in estimating the coefficients in Column 3 (the restricted dataset).

The F-statistics for the unrestricted and restricted versions of Model #5 are 61.17 and 60.46, respectively, with corresponding P-values of 0.0000 for both. Therefore, we are confident that the model's coefficients are jointly significant, and that the model's results are reliable. The r-squared values for the unrestricted and restricted models are 0.13 and 0.16, respectively. This tells us that we are capturing roughly 13-16% of those observable and measurable things that determine future performance. Since we are capturing only 13-16% of these factors, there are likely many other factors that we are not capturing in our data, or that cannot be observed and measured, that are also predictive of future performance.

Table 15. Ordinary Least Squares Estimates of Average Cumulative Relative Value

	Sample=All PMOS	Sample=Ground Assignables
Overall class rank - percent	0.04416	0.04752
	(0.00186)***	(0.00201)***
MOS not in top 3 prefs rcvd	0.12630	-0.15019
	(0.10268)	(0.10953)
Female officer	1.02789	0.93464
	(0.17933)***	(0.18697)***
OCC commission	0.24829	0.40498
	(0.14064)*	(0.15624)***
NROTC commission	0.47519	0.45954
	(0.16146)***	(0.17689)***
MECEP commission	1.07686	1.14269
	(0.21576)***	(0.23298)***
ECP commission	0.47063	0.50282
	(0.28413)*	(0.29723)*
USNA commission	0.62108	0.75993
	(0.17839)***	(0.20058)***
MCP commission	1.02525	1.09625
	(0.38371)***	(0.39847)***
Age when commissioned	-0.02502	-0.03658
	(0.02541)	(0.02741)
Race Black	-0.51282	-0.61185
	(0.21146)**	(0.22012)***
Race all others	-0.05046	-0.10935
	(0.29027)	(0.30145)
Married at 1st record	0.77084	0.84867
	(0.14151)***	(0.15422)***
Divorced at 1st record	0.87075	0.73307
	(0.37341)**	(0.39625)*
Widowed at 1st record	1.40401	1.22045
	(3.83532)	(3.81798)
Constant	-2.10192	-1.75494
	(0.60970)***	(0.65820)***
Observations	5976	4929
R-squared	0.13	0.16
Standard errors in parentheses	F(15, 5960) = 61.17 Prob > F = 0.0000	F(15, 4913) = 60.46 Prob > F = 0.0000
* significant at 10%	** significant at 5%	*** significant at 1%

a. Effects of Final Overall Ranking

The coefficient for final overall ranking in this model is 0.044 in the unrestricted model and 0.0475 in the restricted model. We interpret these coefficients to mean that for every 1% increase in final overall ranking an increase in average FITREP score of 0.0475 points is predicted, all else held constant, using the coefficient produced in the ground assignable model. To extend the example previously used, if an officer were to increase his overall standing by 50% that would predict an increase in average FITREP score of 2.375 points.

This finding is not surprising, as the final lineal standing is a composite of the three areas of evaluation (leadership, military skills, academics.) As we discovered in the first model, the leadership coefficients alone were 0.45 and 0.47 for the unrestricted and restricted models respectively, which basically mirrors the effect of final overall ranking that is demonstrated in this model. In essence, the effect of the leadership ranking is driving the effect of the final overall ranking.

b. Changes in Effects of Other Significant Variables

Not surprisingly, the other statistically significant variables in this model have coefficients that are very close to the coefficients estimated in the Model #1 that included the TBS performance variables instead of the final overall ranking. There were no noteworthy changes in any of these variables.

6. Performance Model #6. Independent Variables: TBS Final Overall Class Ranking, Other-Than-Top-3 MOS Preference, Prior Enlisted Marine

In this model, the commissioning source variables are replaced with the prior enlisted variable. The results of estimating this multivariate model are depicted in Table 16. Column 1 is the list of explanatory variables included in the model specification. Column 2 lists the coefficients and standard errors for each of the corresponding variables in Column 1. The data used in estimating the coefficients in Column 2 included contract aviators (the unrestricted dataset). Column 3 lists the coefficients and standard

errors for each of the corresponding variables in Column 1, and only data on ground assignable officers was used in estimating the coefficients in Column 3 (the restricted dataset).

The F-statistics for the unrestricted and restricted versions of Model #6 are 89.53 and 88.15, respectively, with corresponding P-values of 0.0000 for both. Therefore, we are confident that the model's coefficients are jointly significant, and that the model's results are reliable. The r-squared values for the unrestricted and restricted models are 0.13 and 0.15, respectively. This tells us that we are capturing roughly 13-15% of those observable and measurable things that determine future performance. Since we are capturing only 13-15% of these factors, there are likely many other factors that we are not capturing in our data, or that cannot be observed and measured, that are also predictive of future performance.

Table 16. Ordinary Least Squares Estimates of Average Cumulative Relative Value

	Sample=All PMOS	Sample=Ground Assignables
Overall class rank - percent	0.04516	0.04837
	(0.00183)***	(0.00198)***
MOS not in top 3 prefs rcvd	0.11764	-0.16231
	(0.10275)	(0.10967)
Female officer	1.12279	1.04202
	(0.17814)***	(0.18552)***
Prior Enlisted - from ECP,MCP,MECEP	0.71012	0.65273
	(0.17137)***	(0.18298)***
Age when commissioned	-0.04040	-0.04071
	(0.02249)*	(0.02431)*
Race Black	-0.48460	-0.58642
	(0.21134)**	(0.22004)***
Race all others	-0.07255	-0.12597
	(0.29023)	(0.30139)
Married at 1st record	0.75895	0.82276
	(0.14085)***	(0.15363)***
Divorced at 1st record	0.89519	0.74475
	(0.37206)**	(0.39495)*
Widowed at 1st record	1.53469	1.35530
	(3.84000)	(3.82454)
Constant	-1.52589	-1.36708
	(0.55201)***	(0.59776)**
Observations	5976	4929
R-squared	0.13	0.15
Standard errors in parentheses	F(10, 5965) = 89.53 Prob > F = 0.0000	F(10, 4918) = 88.15 Prob > F = 0.0000
* significant at 10%	** significant at 5%	*** significant at 1%

a. Effects of Prior Enlisted Marine

The coefficient of prior enlisted Marine is statistically significant for both the unrestricted and restricted models at the 1% level. The coefficients for prior enlisted Marine in these models are 0.71 and 0.65, respectively. These coefficients are very close to the coefficients for prior enlisted Marines that were previously estimated in the other models.

b. Changes in Effects of Other Significant Variables

Not surprisingly, the coefficients for the other statistically significant variables in this model are very close to the coefficients for these same variables when they were estimated in the previous models. There are no surprising or large changes in these coefficients.

B. ANALYSIS OF PERFORMANCE BY GRADE

The purpose of the secondary model is to evaluate any change in the effects of the explanatory variables over time during an officer's career progression. To best evaluate any changing effects over time of the explanatory variables, these models were estimated using only the data for ground assignable officers. These models are specified exactly as Performance model #1, except that a model is estimated with the dependent variable as the average cumulative relative value for each of 3 grades, second lieutenant, first lieutenant, and captain. The results of estimating these multivariate models are depicted in Table 17. Column 1 is the list of explanatory variables included in the model specification. Column 2 contains the coefficients and standard errors for the second lieutenant model. Column 3 contains the coefficients and standard errors for the first lieutenant model, and Column 4 contains the coefficients and standard errors for the captain model.

The F-statistics for the models are 22.78, 36.72, and 5.55, respectively. The corresponding P-values for each model are 0.0000. Therefore, we are confident that the model's coefficients are jointly significant, and that each model's results are reliable. The r-squared values for the models are 0.10 for the second lieutenant model, 0.15 for the first lieutenant model, and 0.08 for the captain model. We are therefore capturing 10%, 15% and 8% respectively of those factors or characteristics that predict future performance. There are likely many other factors we have not captured, or are unobservable or unmeasurable, that would also explain future performance.

Table 17. Ordinary Least Squares Estimates of Average Cumulative Relative Value

	For Ground Assignables		
	Second Lieutenant	First Lieutenant	Captain
Academics class rank - percent	0.00956	0.00946	0.00525
	(0.00388)**	(0.00326)***	(0.00749)
Leadership class rank - percent	0.04376	0.04808	0.03560
	(0.00369)***	(0.00314)***	(0.00692)***
Mil Skills class rank - percent	-0.00121	0.00059	0.00760
	(0.00404)	(0.00341)	(0.00767)
MOS not in top 3 prefs rcvd	-0.25296	-0.01436	-0.54376
	(0.19049)	(0.15649)	(0.34608)
Female officer	1.01678	1.28454	0.20862
	(0.29973)***	(0.25322)***	(0.59311)
OCC commission	0.23232	0.62070	0.35346
	(0.25459)	(0.20791)***	(0.44854)
NROTC commission	0.43218	0.54522	-0.40734
	(0.27991)	(0.23934)**	(0.59889)
MECEP commission	0.91754	1.21464	1.06917
	(0.37793)**	(0.31146)***	(0.68704)
ECP commission	0.63407	1.01302	1.33354
	(0.48095)	(0.40257)**	(0.82503)
USNA commission	1.09637	0.51990	-0.06209
	(0.31722)***	(0.27554)*	(0.62850)
MCP commission	0.49482	0.93493	1.91404
	(0.62771)	(0.52703)*	(0.93158)**
Age at commission	0.09013	-0.10857	-0.20577
	(0.04492)**	(0.03650)***	(0.07768)***
Race Black	-0.58733	-0.92639	-0.99954
	(0.35056)*	(0.29117)***	(0.62281)
Race all others	-0.25179	-0.41174	1.47583
	(0.48895)	(0.41405)	(0.84900)*
Married	0.65046	1.14646	-0.13932
	(0.25475)**	(0.20893)***	(0.43717)
Divorced	0.46243	1.21246	-0.25318
	(0.65299)	(0.56741)**	(1.24280)
Widowed	10.03675	-3.15405	0.00000
	(5.06779)**	(4.30587)	(0.00000)
Constant	-5.13787	-0.73988	2.66992
	(1.07970)***	(0.88263)	(1.89143)
Observations	3411	3471	981
R-squared	0.10	0.15	0.08
Standard errors in parentheses	F(17,3393)=22.78 Prob > F= 0.0000	F(17,3453)=36.72 Prob >F=0.0000	F(16,964)=5.55 Prob>F=0.0000
* significant at 10%	** significant at 5%	*** significant at 1%	

1. Effects of the TBS Performance Variables

As the coefficients for academic ranking and military skill ranking show, there is little difference in the effect of either of these two variables by grade. However, when we examine the effect of the leadership ranking, we note that the coefficient for the TBS leadership ranking falls from 0.048 for first lieutenants to 0.036 for captains. This may be an indication of a diminishing effect of the TBS leadership ranking over time. This potential diminishing effect may be reflective of the fact that as Marine officers become more senior, they are less likely to be in prominent leadership roles, and need to rely less heavily on leadership acumen to excel in their jobs. More senior officers fill more and more billets that rely more heavily on administrative, managerial, or technical skill, and that require much less supervisory and leadership effort.

2. Effects of Other Significant Explanatory Variables

As shown in Table 17, most other explanatory variables do not differ substantially by grade, with some exceptions. For example, the positive effect of a USNA commission on FITREP scores appears to diminish as the officer moves from second lieutenant to first lieutenant. The data also suggest that the positive effect of a MCP commission becomes stronger over time, and that the officer who is commissioned via MCP performs at a higher level as he advances in rank. Interestingly, age at first commission becomes statistically significant in the secondary models. This variable has a positive effect for the second lieutenant model, and then takes on a negative coefficient for the first lieutenant and captain models.

We observe that the coefficient for the variable “black” becomes significant at all levels in the first lieutenant model, and increases in magnitude to -0.93 points. The variable for all other races also become significant at the 10% level for the first time in the captain model. This variable has a coefficient of 1.48 in the captain model which predicts that an officer who is neither black nor white has FITREP scores that are 1.48 points higher than others, all other variables held constant.

C. ALTERNATIVE MODEL SPECIFICATIONS AND RESULTS

1. Including TBS FY Cohort Dummy Variables

It may be appropriate to adjust the models specifications by including cohort fiscal year dummies in the model specifications. Each cohort in our dataset is observed for a different length of time, they are observed for a different length of time by their respective reporting seniors, and they also receive a different number of observed fitness reports. These different cohorts also have different experience levels and different sets of experiences.

We may also wish to account for those officers who voluntarily separate from the Marine Corps by including the fiscal year dummies. Those who voluntarily separate from the Marine Corps are, by definition, different from those who stay. There may be a self-selection bias in the performance of those who self-select to leave the Marine Corps.

Appendix C. contains the model results of each of the original performance models, 1-6, with TBS FY cohort dummy variables added. A comparison of TBS performance variables between our original performance models, and these modified models reveals that there is virtually no difference in the coefficients of the TBS performance variables when TBS FY cohorts are added. This acts as a test of the robustness of our main results, and as the coefficients in both sets of models are basically the same we find that our primary performance models are robust to alternative model specifications.

2. Sample Restriction to Those Cohorts Who are Observed Longest

Another way to deal with the issue of officers being observed for different lengths of time in our dataset is to restrict the sample to those cohorts who have been observed for roughly an equal length of time and compare the estimated coefficients of that model to the estimated coefficients of the primary performance model. In this case, we chose to restrict the sample to TBS FY 99 and TBS FY 00. These cohorts are roughly equal sized, meaning that we are capturing virtually the entire cohort, and they have been observed

roughly the entire duration of the dataset (until 2005). For this model, the primary explanatory variable was the overall TBS class ranking percentage. This was necessary because FY 00 does not contain any of the other 3 TBS performance variables.

In Table 18, the results of Model #5 for both the restricted and unrestricted samples are shown next to the results of the modified Model #5, which uses the same specification but restricts the sample to TBS FY 99 and TBS FY 00.

Table 18. Ordinary Least Squares Results – Model #5 and Modified Models Using Only Sample Containing TBS FY99 and TBS FY00

	Sample=All PMOS	Sample=GA	Sample=99 & 00	Sample=99 & 00
	Avg Cum Rel Val for all reports	Avg Cum Rel Val for all reports	All PMOS	Ground Assignables
TBS rank	0.04416	0.04781	0.04144	0.04344
	(0.00186)***	(0.00201)***	(0.00259)***	(0.00272)***
Non top 3 MOS	0.12874	-0.14702	0.61836	0.45924
	(0.10272)	(0.10950)	(0.13800)***	(0.14729)***
Female	1.02700	0.93697	0.66430	0.71296
	(0.17934)***	(0.18685)***	(0.26729)**	(0.27531)***
OCC	0.24800	0.40689	0.20853	0.16923
	(0.14064)*	(0.15613)***	(0.19031)	(0.20085)
NROTC	0.47542	0.46540	0.71915	0.80121
	(0.16145)***	(0.17661)***	(0.22613)***	(0.23846)***
MECEP	1.07747	1.15658	1.43178	1.33126
	(0.21577)***	(0.23276)***	(0.30456)***	(0.31723)***
ECP	0.47133	0.51098	0.52836	0.41789
	(0.28413)*	(0.29690)*	(0.38098)	(0.38995)
USNA	0.62189	0.75451	1.00209	1.01733
	(0.17841)***	(0.20053)***	(0.24725)***	(0.26613)***
MCP	1.02697	1.10352	1.49467	1.48017
	(0.38373)***	(0.39813)***	(0.44606)***	(0.45355)***
Age	-0.02509	-0.03735	-0.12288	-0.11949
	(0.02541)	(0.02733)	(0.03580)***	(0.03704)***
Black	-0.51367	-0.60613	-0.65730	-0.64535
	(0.21147)**	(0.21997)***	(0.29381)**	(0.29945)**
Other race	-0.05129	-0.10607	0.42703	0.42561
	(0.29028)	(0.30126)	(0.38672)	(0.39815)
Married	0.77077	0.83511	0.75865	0.81327
	(0.14151)***	(0.15411)***	(0.18810)***	(0.19815)***
Divorced	0.87095	0.72296	0.74901	0.59675
	(0.37341)**	(0.39597)*	(0.50144)	(0.51171)
Widowed	1.40570	1.23484	0.00000	0.00000
	(3.83533)	(3.81547)	(0.00000)	(0.00000)
Constant	-2.10124	-1.75057	0.05107	0.03911
	(0.60966)***	(0.65667)***	(0.85984)	(0.88891)

Observations	5976	4929	2430	2183
R-squared	0.13	0.16	0.17	0.18
Standard errors in parentheses	F(15,5960)=61.17 Prob>F=0.0000	F(15,4913)=60.97 Prob>F=0.0000	F(14,2415)=35.26 Prob>F=0.0000	F(14,2168)=34.49 Prob>F=0.0000
* significant at 10%	** significant at 5%	*** significant at 1%		

A comparison of the coefficients for overall TBS class ranking reveals that the results of the modified models that restrict the sample to TBS FY 99 and TBS FY 00 (in columns 4 and 5) are numerically and practically very close to those of the primary models (in columns 2 and 3). We conclude that overall TBS class ranking has about the same effect in the modified models as in the primary models. This is another test of the robustness of our main results as to the effect of TBS class ranking. We can, therefore, again conclude that our model is robust to alternative model specifications and samples.

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VII. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

A. SUMMARY AND CONCLUSIONS

The performance models in Chapter VI were specified to analyze later performance of newly commissioned Marine Corps officers, measured by average cumulative relative values of fitness reports, as a function of various TBS performance variables, demographics, prior enlisted service, MOS assignment, and commissioning source. Table 19 below lists the variables that were statistically significant in the six performance models (models 1-6). For each model, an unrestricted and restricted version was estimated. The unrestricted models were estimated using data from all officers, to include contract aviators. The restricted model omitted contract aviators. The asterisks indicate at what level the variable was significant: *** means that the variable was statistically significant at the 1% level for that particular model, ** is significant at the .05 level, and * is significant at the .10 level.

Table 19. Statistically Significant Predictors of Officer Performance

Statistically Significant Predictors												
	Model #1		Model #2		Model #3		Model #4		Model #5		Model #6	
Variable	**U**	**R**	**U**	**R**	**U**	**R**	**U**	**R**	**U**	**R**	**U**	**R**
Academics	***	***	***	***								
Leadership	***	***	***	***								
Top Third					***	***	***	***				
Bottom Third					***	***	***	***				
Final Ranking									***	***	***	***
MOS Pref		*		*		*		**				
OCC	*	***			*	***			*	***		
NROTC	**	**			***	***			***	***		
MECEP	***	***			***	***			***	***		
ECP	*	**			**	**			*	*		
USNA	**	***			***	***			***	***		
MCP	*	*			***	***			***	***		
Female	***	***	***	***	***	***	***	***	***	***	***	***
Prior Enlisted			***	***			***	***			***	***
Age							**	**			*	*
Black	***	***	***	***	***	***	***	***	**	***	**	***
Married	***	***	***	***	***	***	***	***	***	***	***	***
Divorced	*		*		***	**	***	**	**	*	**	*

A secondary model was also estimated to examine the effects of the explanatory variables on average cumulative relative values for different grades. These models were specified so that fitness report scores for second lieutenants, first lieutenants, and captains were analyzed separately as a function of the explanatory variables, especially TBS performance. Table 20 lists those variables that were statistically significant for the three different specifications of this model.

Table 20. Statistically Significant Predictors of Performance by Grade.

Statistically Significant Predictors			
Variable	2ndLt	1stLt	Capt
Academics	**	***	
Leadership	***	***	***
OCC		***	
NROTC		**	
MECEP	**	***	
ECP		**	
USNA	*	***	
MCP		*	**
Female	***	***	
Age	**	***	***
Black	*	***	
Married	**	***	
Divorced		**	

1. TBS Performance Variables

Of the three primary TBS performance variables only the leadership ranking and academics ranking were statistically significant in models 1 and 2. Of these, the leadership ranking was the most predictive of future performance. Leadership ranking coefficients were 0.045 to 0.047 while the coefficient of the academics ranking was only 0.01 at its maximum in the restricted models 1 and 2. We, therefore, conclude that the leadership ranking is much more predictive of future performance than the academics ranking.

These findings allow us to draw several conclusions about the evaluation process used by The Basic School. Based on our analysis, performance in the military skills events at TBS has no predictive effect on junior officers' performance. Also, while the

academics ranking was statistically significant, it has little practical significance. The coefficient for this variable is so small that it predicts a very small change in average fitness report scores for a large change in academics ranking.

2. Standing in the System of Thirds

The variables indicating an officer's standing in the system of thirds were significant at the 1% level in all models. An officer who finished in the top third of his TBS class is predicted to have average fitness report scores that are 1.03 points higher, unrestricted model 3 to 1.22 points higher, restricted model 4, than the officer who finishes in the middle third, all other variables held constant. The officer who finishes in the bottom third of his TBS class is predicted to have fitness report scores that are 1.76 points lower, unrestricted model 3 to 1.88 points lower, restricted model 4, than the middle third officer, all other variables held constant. We, therefore, conclude that an officer's performance at TBS, as measured by his standing in the system of thirds, is predictive of that officer's future performance

3. Final Overall Ranking

The final overall ranking was statistically significant at the 1% level for all models. This variable's estimated coefficient was very close in size to the coefficient for the leadership ranking in each of the like models. We conclude that final overall ranking is also highly predictive of future performance. As the final overall ranking is a composite of the leadership, academics, and military skills rankings, and leadership receives the highest weight, this conclusion is not surprising. Of note, however, is that since this variable's coefficient was nearly the same as that of the leadership ranking's coefficient for the same models, we can also conclude that the predictive effect of the final overall ranking is due largely to the predictive effect of the leadership ranking component.

4. MOS Preference Received

An officer that was assigned an MOS preference that was not in his top 3 MOS preferences is predicted to have average fitness report scores that are 0.20 to 0.22 points lower than an officer who was assigned a top 3 MOS preference, all other variables held constant. This variable was only found to be statistically significant in the restricted models that used only the ground assignable officer population. The small effect of this variable is a surprising finding. As prior research indicates, those individuals who are working in occupations they choose are more likely to enjoy their work and are more likely to be higher performing. The fact that this variable was not statistically significant in the unrestricted models (that included all contract aviators) suggests that the relationship between TBS performance and future fleet performance that is true of ground assignable officers, is not true of contract aviators. We hypothesize that there is a difference between the TBS performance of the ground assignable officers and the TBS performance of contract aviators. Further, we believe that this performance difference is the result of the incentive for ground assignable officers to perform well at TBS and the lack of incentive for contract aviators to perform well at TBS.

We also believe that the small effect of being assigned an MOS that is not in the top 3 preferences can be accounted for by examining the nature of the officer who is likely to become a Marine and by the culture in which those officers work and live. We believe that those who are drawn to the Marine Corps are unlikely to be "quitters" or to allow their performance to suffer because they did not get assigned their ideal MOS. The Marine Corps also has a mantra that is repeated wherever one goes in the organization--"bloom where you are planted." This attitude is prevalent in the Marine Corps, and as Marines are likely to do several tours of duty in jobs that are not directly related to their primary MOS, it is also a necessary attitude.

It is our conclusion that the MOS assignment process, the nature of Marine officers, and the Marine culture all work together to mitigate any performance disincentive that may exist from being assigned a low MOS preference.

5. Commissioning Sources

Commissioning source variables were all statistically significant at various levels in all models. Generally, commissioning source variables carried higher levels of statistical significance in the restricted models than in the unrestricted models. We conclude that an officer's commissioning source is predictive of future performance. Specifically, officers from enlisted-to-officer programs perform better than those from other programs. Commissioning sources that are indicative of some type of military acculturation are also more highly predictive of future performance than those that are associated with little to no military acculturation.

We also conclude that the effect of commissioning sources on future performance is masked in those models that include contract aviators. We make this conclusion based on the fact that in five instances, commissioning source variables became more highly significant in the restricted model, and in no case is the statistical significance of a commissioning source variable stronger in the unrestricted model than the restricted model. This again suggests that there is a performance difference between ground assignable officers and contract aviators.

6. Prior Enlisted Marine

Prior enlisted Marine service was statistically significant at the 1% level in all models. All other variables equal, prior enlisted Marine service predicts higher fitness report scores of 0.54 to 0.89 points. We conclude that Marine officers who are commissioned via the Marine Corps' enlisted-to-officer commissioning sources have better performance in the operating forces than those officers who do not have prior enlisted Marine service, all else equal. We also conclude that this effect is relatively small and has little practical significance given its magnitude.

7. Gender

The coefficient for the variable "female" was statistically significant to the 1% level in every model. We, therefore, conclude that there is a difference in fitness report

scores between males and females. Our analysis predicted that an officer who has all the attributes of the reference group, but is female, has fitness report scores that are 1.3 to 0.84 points higher than a male. This finding has practical significance as well, as the magnitude of the effect is rather large. An analysis of what factors account for this difference in fitness report scores is beyond the scope of this study. Hence, we cannot determine if this is due to a difference in actual performance or characteristics unique to females of the reference group.

8. Race

The coefficient for the variable "black" was statistically significant at the 1% level in every model excepting two models in which it was statistically significant at the 5% level. We, therefore, conclude that there is a difference in fitness report scores between whites and blacks. Our analysis predicted that an officer that has all the attributes of the reference group, but is black, has fitness report scores that are 0.48 points lower in unrestricted model 6, to 0.78 points lower in restricted model 1 than a white member of the reference group. We conclude that at the upper end of this range this difference is practically significant due to its magnitude. An analysis of what factors account for this difference in fitness report scores is beyond the scope of this study. Hence, we cannot determine if this is due to a difference in actual performance or performance characteristics unique to black officers of the reference group.

9. Marital Status

We conclude that the marital status of an officer is predictive of future performance. The "married" variable was statistically significant at the 1% level in every model, and the "divorced" variable was statistically significant in every model except two. The coefficients for these variables were, in every case, positive. We, therefore, also conclude that married or divorced officers who have all the other attributes of our reference group will be higher performers than the reference group. We believe that the practical significance of this finding is that maturity plays a role in the effectiveness of an

officer. We make this assertion based on the intuition that an officer who is married, or has been through a marriage and is now divorced, has greater experience, maturity, and skill in managing interpersonal conflict.

10. Effects by Grade

Based on our separate analysis of fitness report scores for second lieutenants, first lieutenants, and captains, we conclude that the predictive nature of the leadership ranking at TBS is an enduring effect, as noted by the coefficients of the leadership ranking variable in our three models. The captain model has a relatively small number of observations (981), and though the leadership ranking variable is statistically significant at the 1% level in this model, we believe that further analysis of TBS performance as a predictor of future performance should be conducted for more senior officers, using more observations.

B. THESIS RESEARCH QUESTIONS

1. What is the relationship between the weighted/graded areas at The Basic School (Leadership, Academics, Military Skills) and performance in the operating forces as measured by fitness report scores?

The results of this thesis indicate that of the three weighted/graded areas of evaluation at TBS, only one is a significant predictor of future performance. The leadership ranking is the best predictor of future performance, among the three areas of evaluation. Specifically, an officer who increases his leadership ranking by 1% is predicted to have average fitness report scores that are 0.045 points higher, according to restricted model 1, all other variables held constant. This improvement in fitness report scores becomes substantial when we compare officers who are identical in every way with the exception of their respective leadership rankings. Of these two officers, the officer who has a leadership ranking that is 50% higher than the other is predicted to have fitness report scores that are 2.25 points higher than the other. The practical significance of this finding is that higher fitness report scores are indicative of higher performing officers, and are also predictive of future promotions.

The academic ranking was found to be statistically significant, but of little practical significance due to the magnitude of the coefficient for this variable, which was, at its maximum, 0.01. According to restricted model 1, an officer who increases his academic ranking by 1% is predicted to have average fitness report scores that are .01 points higher, all other variables held constant. To extend the above example, two officers who are identical in every respect, but have academics rankings that are 50% different, are predicted to have a difference in average fitness report scores of 0.5 points. The military skills ranking was not found to be statistically significant in any model, and is therefore considered to have no predictive effect on future performance.

2. What is the relationship between the student's final lineal standing at TBS and performance in the operating forces?

Our analysis of final overall ranking reveals that the predictive effect of the final overall TBS ranking on future performance is virtually the same as the predictive effect of the leadership ranking by itself. This finding is not surprising given that the final overall ranking is a composite of the leadership, academics, and military skills rankings. An officer who improves his final overall ranking by 1% is predicted to have average fitness report scores that are 0.044 to 0.048 points higher, all other variables held constant.

3. Are individuals with certain background characteristics more successful in the operating forces?

Our thesis analyzed the effects of basic demographics and commissioning sources. Of these, several variables were found to be statistically significant predictors of future performance. Of the demographic characteristics, gender and race were highly predictive of junior officer performance. All else equal, a female officer is predicted to have higher average fitness report scores and a black officer is predicted to have lower average fitness report scores.

Of the commissioning source variables, all commissioning programs were found to have higher fitness report scores than PLC, all other variables held constant. Of these

commissioning source effects, the greatest effects were found in the Marine Corp' enlisted-to-officer programs which predicted the greatest increase in average fitness report scores.

4. Is the quality spread the most effective tool for assigning MOSs from The Basic School?

The results of our analysis cannot answer this question as it is posed. Rather, we can state that the quality spread does ensure that higher, lower, and average performing officers are distributed somewhat equitably across all ground assignable MOSs due to the quality spread. We cannot determine based on this analysis whether the quality spread is the most effective system used to assign an MOS. Our models showed that there are performance differences between officers who finish TBS in different thirds. Notably, top third officers of the reference group are predicted to have fitness report scores that are 1.03 points higher, unrestricted model 3 to 1.22 points higher, restricted model 4, than middle third officers of the reference group, all else held constant. Also, bottom third officers of the reference group are predicted to have fitness report scores that are 1.76 points lower, unrestricted model 3 to 1.86 points lower, restricted model, than the middle third officers of the reference group. This means, according to unrestricted model 3 and restricted model 4 that there is a predicted 2.79 to 3.09 point difference in fitness report scores between bottom third officers and top third officers of the reference group.

We can therefore state that due to the manner in which MOSs are assigned to students as outlined in Chapter II, a relatively equal proportion of high, average, and low performing officers are being distributed amongst the ground assignable MOSs. We can also state that the quality spread is doing what it is intended to do by distributing performance amongst the MOSs somewhat randomly.

5. Is the Staff Platoon Commander doing an adequate job of evaluating student officers?

Again, our analysis cannot answer this question as it is written. However, we have determined that leadership ranking is the most predictive TBS performance variable of future performance. As the SPC assigns 90% of the leadership grade by virtue of ranking his students for each leadership evaluation, we conclude that the SPC is evaluating students according to the traits and characteristics that predict actual performance in the operating forces.

What our analysis cannot determine is how well the SPC is making this evaluation because we have no baseline from which to draw conclusions about how well the SPC makes his evaluations.

C. RECOMMENDATIONS

1. Weight the leadership evaluation ranking at TBS more heavily and reduce the weighting of academics and military skills rankings in the TBS student evaluation process.

The rationale behind this recommendation is rooted in the Marine Corps' policy of promoting the best and most fully qualified officers, as highlighted in Chapter II. Officers are ranked lineally, by date of commission, in the Blue Book by final overall TBS ranking. The current weighting of academics, leadership, and military skills dictates that academics and military skills account for 64% of this final ranking, while leadership accounts for only 36% of the final ranking. Our analysis demonstrates that academics and military skills actually predict very little of future performance. We, therefore, recommend that the leadership ranking be weighted more heavily in the performance evaluation at TBS. This assures that the factor that is most predictive of fleet performance of junior officers plays a larger part in establishing the final lineal ranking and, therefore, plays a much larger role in determining when officers are being promoted.

Our recommendation is that TBS adopt a weighting distribution that is structured as follows:

Leadership	50%
First Leadership Evaluation	25%
Second Leadership Evaluation	25%
Academics	25%
Military Skills	25%

Table 21 provides an example of how lineal rankings in a TBS company would change with this new weighting policy. Note that these observations are taken generally from the middle of the company lineal standing, and that the "# Change" column indicates the number of lineal places that the officer's standing has changed (up (+) or down (-)), from the present weighting system to the proposed weighting system.

Table 21. Lineal Standing Changes as a Result of the Proposed Weighting Change

Old Rank	Old GPA	ID	New GPA	New Rank	# Change
109	88.3542	A	87.91893	106	+3
110	88.3351	B	87.7711	108	+2
111	88.3112	C	87.39268	119	-8
112	88.1698	D	86.7462	130	-18
113	88.115	E	87.9717	103	+10
114	88.0773	F	87.68158	111	+3
115	88.0346	G	86.64618	133	-18
116	87.926	H	87.16555	123	-7
117	87.9069	I	87.58543	113	+4
118	87.8505	J	86.61735	134	-16
119	87.8447	K	87.5975	112	+7
120	87.8302	L	86.5363	136	-16
121	87.7393	M	87.7635	109	+12
122	87.7144	N	86.66353	132	-10
123	87.6833	O	85.87955	151	-28
124	87.6071	P	87.57153	114	+10
125	87.6013	Q	86.84053	126	-1
126	87.5764	R	86.17828	143	-17
127	87.5562	S	86.96845	125	+2
128	87.5442	T	87.88263	107	+21
129	87.5165	U	87.00163	124	+5
130	87.5127	V	87.5392	116	+14
131	87.4991	W	86.78378	129	+2

132	87.437	X	85.8713	152	-20
133	87.3779	Y	86.05098	148	-15
134	87.3099	Z	87.2751	121	+13
135	87.3083	AA	86.28013	140	-5
136	87.3071	BB	86.57228	135	+1
137	87.2932	CC	86.0122	149	-12
138	87.2815	DD	87.50903	117	+21
139	87.2366	EE	86.46568	138	+1
140	87.1756	FF	85.60865	157	-17
141	87.0953	GG	88.40195	95	+46
142	87.0148	HH	86.74368	131	+11
143	86.9099	II	86.21308	142	+1
144	86.9087	JJ	85.17268	170	-26
145	86.9047	KK	86.26298	141	+4
146	86.8994	LL	85.5705	158	-12
147	86.7059	MM	85.3089	165	-18
148	86.6713	NN	86.49483	137	+11
149	86.6226	OO	85.88953	150	-1

Table 21 shows that the largest changes in ranking are for the officers who have high leadership scores but relatively low academics and military skills scores, or vice versa. For example, officer GG improved his lineal standing by 46 places. Further examination of this officer's TBS performance reveals that, under the present weighting system, he was ranked 229th in academics, 26th in leadership, and 213th in military skills, resulting in an overall ranking of 141. However, when the proposed weighting system is applied, his overall ranking improves to 95 on the strength of his leadership performance (+46).

2. Retain the quality spread for MOS assignment

The results of our analysis have shown that the quality spread does what it is intended to do by distributing high, average, and low performing officers to each of the ground assignable MOSs. We recommend that the Marine Corps continue to use the quality spread as the basis for MOS assignment at TBS as long as the Marine Corps deems that a random distribution such as this is desirable.

3. Ensure that each officer's top 10 MOS preferences are maintained by CNA

The dataset obtained from CNA contains only the top 3 MOS preferences for each officer. This does not allow for an analysis of performance as a function of MOS preference assigned outside of those top 3 MOSs. TBS states its MOS assignment goals are oriented toward placing officers in a top 5 MOS preference, so can should warehouse information on each officer's top 5 MOS preferences at a minimum. We recommend, however, that CNA be provided with, and maintain, the top 10 MOS preferences for each officer. This recommendation is made so that future analysis can determine at what point, if any, does performance begin to degrade due to an officer being assigned a low MOS choice.

4. Standardize MOS preference submission for contract aviators as part of the MOS assignment process

The CNA dataset includes the top 3 MOS preferences for each officer; however, the MOS preferences for contract aviators are not standardized. Many observations on contract aviators have MOS preferences for aviation listed, while others have all ground assignable MOSs listed. This creates several problems. The first is that several officers from each company compete for and are assigned aviation MOSs. These officers are not "contract" aviators, but are assigned aviation MOSs. In this analysis, we determined that the best method to resolve this issue was to code the data so that each aviation officer was noted to have been assigned his first choice of MOS. We recommend that TBS adopt a policy that all contract aviators list only ground assignable MOSs in their preference lists, and that only those ground assignable officers who are qualified and desire to be aviators or Naval Flight Officers (NFOs) list aviation MOSs as their first choice, or first and second choice for those who desire either "pilot" or "NFO." This ensures that an aviator who was not a contract aviator can easily be identified through the MOS preferences.

5. Create "Prior enlisted" and "Prior enlisted Marine" variables that will be warehoused in the Total Force Data Warehouse, or as part of the TBS performance data maintained by CNA

We recommend that prior enlisted officers have a variable attached to their electronic record in TFDW that identifies them as prior enlisted officers. We further recommend that this variable be a categorical variable so as to allow for a designation of what service the officer served as an enlisted member. In the TFDW data we were able to determine, for the most part, which officers were prior enlisted by analyzing Pay Entry Base Date or Armed Forces Active Duty Base Date. We had no means to identify which of these were prior enlisted Marines and which were from other services. This data was also contradictory in many cases. The CNA data had a commissioning source variable from which we constructed a prior enlisted variable. We determined that the most reliable method was to use the Marine Corps officer-to-enlisted commissioning sources as the identifier for prior enlisted Marine service. We could not capture any officer who was a prior enlisted Marine, but did not get commissioned via the Marine Corps' enlisted-to-officer commissioning programs.

6. Administer exit survey questions to determine the effect of MOS preference assigned on the separation decisions of voluntarily separating company grade officers

Our analysis demonstrated that the MOS preference an officer is assigned while a student at TBS has little effect on that officer's future performance. What we cannot determine, however, is what effect the MOS assigned may have on the retention decisions made by individuals. We recommend that voluntarily separating company grade officers be asked, using an exit survey, what impact the MOS they were assigned has on their decisions to voluntarily leave the Marine Corps. This is especially important now as the Marine Corps has been tasked to grow in end strength.

7. Continue assigning officers to their highest MOS preferences

Though our analysis demonstrated that MOS preference has little practical effect on future performance, we believe that the Marine Corps must continue to strive to assign officers to the highest MOS preferences possible. We believe there will be positive

retention effects from assigning officers to high MOS preferences. We also believe that the knowledge that every officer will have a fair chance of being assigned their MOS of preference is beneficial to recruiting, and that potential officer candidates would be less inclined to serve in the Marine Corps if they believed that the organization did not attempt to assign all officers to MOSs based on a policy of highest preference possible, or best suitability.

D. RECOMMENDATIONS FOR FURTHER RESEARCH

1. Conduct an analysis of officer performance by MOS to determine the overall effectiveness of the quality spread. Based on this analysis, determine if the Marine Corps should modify the quality spread in order to better distribute performance across the MOSs

The results of our analysis allowed us to determine that the quality spread does what it is intended to do. The quality spread ensures that a relatively equal distribution of higher performing, lower performing, and average performing officers are allocated to each of the ground assignable MOSs. The results of our analysis cannot be applied to an individual MOS, as we did not evaluate any individual MOSs. Hence, our analysis cannot determine how well performance is distributed by individual MOSs. An analysis of the distribution of MOS preference assigned to each MOS, as well as an analysis of the average cumulative relative values of the fitness reports for those officers assigned to each MOS would allow for a determination of how well the quality spread actually distributes performance across the MOSs. Based on the results of this analysis, a determination can be made as to whether the Marine Corps should modify the quality spread and adopt a system of sixths to replace the present system of thirds.

There are traditionally unpopular MOSs that are more likely to be found lower on the preference lists of ground assignable officers. Ground Supply (MOS 3002) and Adjutant (MOS 0180) are traditionally two unpopular MOSs. Figure 7.1 below demonstrates the effect of adopting a system of sixths instead of the present system of thirds. In this example, Ground Supply is given 6 total Ground Supply allocations to fill. Because this MOS is traditionally lower on the MOS preference lists, normally officers who are lower in their respective thirds are assigned to this MOS. In the system of sixths,

an unpopular MOS may still receive officers who are lower in their respective sixths, but several of those officers will be lineally higher than they would otherwise have been in the system of thirds.

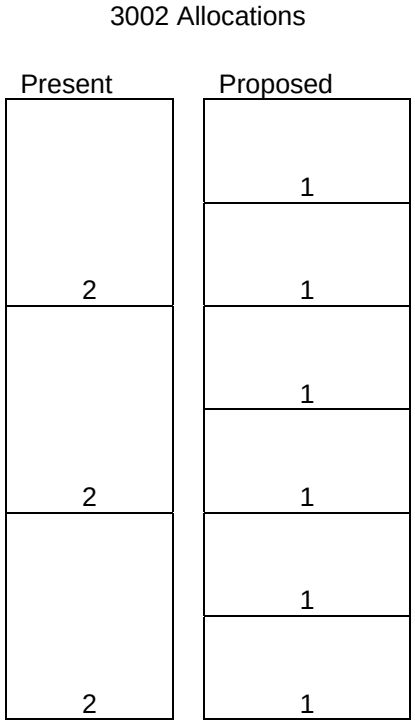

Figure 4. Hypothetical distribution of MOSs in the proposed system of sixths

2. Conduct an analysis of performance differences between contract aviators and ground assignable officers at TBS

Several of the results of our analysis suggest that there is a difference in the performance of contract aviators and ground assignable officers. Our analysis, however, did not attempt to determine if there is a performance difference at TBS between these two groups. There is also a long-standing preconception amongst the faculty and students at TBS that many contract aviators do not fully immerse themselves in their education at The Basic School because contract aviators do not compete for an MOS assignment. By determining if there is a performance difference between contract aviators and ground assignable officers, the Marine Corps could determine if there needs to be a policy change to ensure that every officer has an equal incentive to perform to the best of their ability at TBS.

3. Analysis of FITREP score differences between male and female officers

As our analysis has shown, there is a difference in fitness report scores between males and females. We believe an analysis should be conducted to determine why this difference exists and to allow the Marine Corps to consider if policy changes are necessary based on the results of the analysis.

4. Analysis of FITREP score differences between black officers and non-black officers

As our analysis has shown, there is a difference in fitness report scores between a whites and blacks. Our analysis did not attempt to determine what factors account for this difference in fitness report scores. We believe an analysis should be conducted to determine why this difference exists and to allow the Marine Corps to consider if policy changes are necessary based on the results of the analysis.

5. TBS performance as a predictor of future performance over time.

The Marine Corps' present Performance Evaluation System instituted numerical scales for evaluations, replacing a system in which the greatest weight was given to those reports that were well written. This analysis used the new fitness report data from the date the new system was first implemented until the end of FY 2005. Our analysis does not attempt to evaluate TBS performance as a predictor of future performance for officers past the rank of captain. Moreover, most of the captains in the data set are very junior. We believe that it would be worthwhile to analyze the fitness report scores of more senior officers as a function of TBS performance. This would allow the Marine Corps to determine how long-lasting the predictive effects of TBS performance are for officers as they become further removed from their education at TBS. For example, fitness report data can be obtained from the implementation point of the new PES (1999) up to the present (2008). That data could then be collapsed by id and rank, giving dependent variables by rank. Models similar to ours could then be estimated using TBS performance and other demographics as the explanatory variables.

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APPENDIX A. FITNESS REPORT

USMC FITNESS REPORT (1610)
NAVMC 10835A (Rev. 1-01)(P
PREVIOUS EDITIONS WILL NOT BE USED

DO NOT STAPLE
THIS FORM

COMMANDANT'S GUIDANCE

The completed fitness report is the most important information component in manpower management. It is the primary means of evaluating a Marine's performance and is the Commandant's primary tool for the selection of personnel for promotion, augmentation, resident schooling, command, and duty assignments. Therefore, the completion of this report is one of an officer's most critical responsibilities. Inherent in this duty is the commitment of each Reporting Senior and Reviewing Officer to ensure the integrity of the system by giving close attention to accurate marking and timely reporting. Every officer serves a role in the scrupulous maintenance of this evaluation system, ultimately important to both the individual and the Marine Corps. Inflationary markings only serve to dilute the actual value of each report. Reviewing Officers will not concur with inflated reports.

A. ADMINISTRATIVE INFORMATION

1. Marine Reported On:
a. Last Name | b. First Name | c. MI | d. SSN | e. Grade | f. DOR | g. PMOS | h. BILMOS

2. Organization:
a. MCC | b. RUC | c. Unit Description

3. Occasion and Period Covered:
a. OCC | b. From | To | c. Type

4. Duty Assignment (descriptive title):

5. Special Case:
a. Adverse ☐ b. Not Observed ☐ c. Extended ☐

6. Marine Subject Of:
a. Commendatory Material ☐ b. Derogatory Material ☐ c. Disciplinary Action ☐

7. Recommended For Promotion:
a. Yes ☐ b. No ☐ c. N/A ☐

8. Special Information:

a. QUAL		d. HT(in.)		g. Reserve Component	
b. PFT		e. WT		h. Future Use	
c. Status		f. Body Fat		i. Future Use	

9. Duty Preference:

	a. Code	b. Descriptive Title
1st		
2nd		
3rd		

10. Reporting Senior:
a. Last Name | b. Init | c. Service | d. SSN | e. Grade | f. Duty Assignment

11. Reviewing Officer:
a. Last Name | b. Init | c. Service | d. SSN | e. Grade | f. Duty Assignment

B. BILLET DESCRIPTION

C. BILLET ACCOMPLISHMENTS

1. Marine Reported On: a. Last Name	b. First Name	c. MI	d. SSN	2. Occasion and Period Covered: a. OCC	b. From	To

D. MISSION ACCOMPLISHMENT

1. PERFORMANCE. Results achieved during the reporting period. How well those duties inherent to a Marine's billet, plus all additional duties, formally and informally assigned, were carried out. Reflects a Marine's aptitude, competence, and commitment to the unit's success above personal reward. Indicators are time and resource management, task prioritization, and tenacity to achieve positive ends consistently.

ADV						N/O
	Meets requirements of billet and additional duties. Aptitude, commitment, and competence meet expectations. Results maintain status quo.		Consistently produces quality results while measurably improving unit performance. Habitually makes effective use of time and resources; improves billet procedures and products. Positive impact extends beyond billet expectations.		Results far surpass expectations. Recognizes and exploits new resources; creates opportunities. Emulated; sought after as an expert with influence beyond unit. Impact significant; innovative approaches to problems produce significant gains in quality and efficiency.	

A	B	C	D	E	F	G	H
☐	☐	☐	☐	☐	☐	☐	☐

2. PROFICIENCY. Demonstrates technical knowledge and practical skill in the execution of the Marine's overall duties. Combines training, education and experience. Translates skills into actions which contribute to accomplishing tasks and missions. Imparts knowledge to others. Grade dependent.

ADV						N/O
	Competent. Possesses the requisite range of skills and knowledge commensurate with grade and experience. Understands and articulates basic functions related to mission accomplishment.		Demonstrates mastery of all required skills. Expertise, education and experience consistently enhance mission accomplishment. Innovative troubleshooter and problem solver. Effectively imparts skills to subordinates.		True expert in field. Knowledge and skills impact far beyond those of peers. Translates broad-based education and experience into forward thinking, innovative actions. Makes immeasurable impact on mission accomplishment. Peerless teacher, selflessly imparts expertise to subordinates, peers, and seniors.	

A	B	C	D	E	F	G	H
☐	☐	☐	☐	☐	☐	☐	☐

JUSTIFICATION:

E. INDIVIDUAL CHARACTER

1. COURAGE. Moral or physical strength to overcome danger, fear, difficulty or anxiety. Personal acceptance of responsibility and accountability, placing conscience over competing interests regardless of consequences. Conscious, overriding decision to risk bodily harm or death to accomplish the mission or save others. The will to persevere despite uncertainty.

ADV						N/O
	Demonstrates inner strength and acceptance of responsibility commensurate with scope of duties and experience. Willing to face moral or physical challenges in pursuit of mission accomplishment.		Guided by conscience in all actions. Proven ability to overcome danger, fear, difficulty or anxiety. Exhibits bravery in the face of adversity and uncertainty. Not deterred by morally difficult situations or hazardous responsibilities.		Uncommon bravery and capacity to overcome obstacles and inspire others in the face of moral dilemma or life-threatening danger. Demonstrated under the most adverse conditions. Selfless. Always places conscience over competing interests regardless of physical or personal consequences.	

A	B	C	D	E	F	G	H
☐	☐	☐	☐	☐	☐	☐	☐

2. EFFECTIVENESS UNDER STRESS. Thinking, functioning and leading effectively under conditions of physical and/or mental pressure. Maintaining composure appropriate for the situation, while displaying steady purpose of action, enabling one to inspire others while continuing to lead under adverse conditions. Physical and emotional strength, resilience and endurance are elements.

ADV						N/O
	Exhibits discipline and stability under pressure. Judgment and effective problem-solving skills are evident.		Consistently demonstrates maturity, mental agility and willpower during periods of adversity. Provides order to chaos through the application of intuition, problem-solving skills, and leadership. Composure reassures others.		Demonstrates seldom-matched presence of mind under the most demanding circumstances. Stabilizes any situation through the resolute and timely application of direction, focus and personal presence.	

A	B	C	D	E	F	G	H
☐	☐	☐	☐	☐	☐	☐	☐

3. INITIATIVE. Action in the absence of specific direction. Seeing what needs to be done and acting without prompting. The instinct to begin a task and follow through energetically on one's own accord. Being creative, proactive and decisive. Transforming opportunity into action.

ADV						N/O
	Demonstrates willingness to take action in the absence of specific direction. Acts commensurate with grade, training and experience.		Self-motivated and action-oriented. Foresight and energy consistently transform opportunity into action. Develops and pursues creative, innovative solutions. Acts without prompting. Self-starter.		Highly motivated and proactive. Displays exceptional awareness of surroundings and environment. Uncanny ability to anticipate mission requirements and quickly formulate original, far-reaching solutions. Always takes decisive, effective action.	

A	B	C	D	E	F	G	H
☐	☐	☐	☐	☐	☐	☐	☐

JUSTIFICATION:

1. Marine Reported On: a. Last Name	b. First Name	c. MI	d. SSN	2. Occasion and Period Covered: a. OCC	b. From	To

F. LEADERSHIP

1. LEADING SUBORDINATES. The inseparable relationship between leader and led. The application of leadership principles to provide direction and motivate subordinates. Using authority, persuasion and personality to influence subordinates to accomplish assigned tasks. Sustaining motivation and morale while maximizing subordinates' performance.

ADV	Engaged; provides instructions and directs execution. Seeks to accomplish mission in ways that sustain motivation and morale. Actions contribute to unit effectiveness.		Achieves a highly effective balance between direction and delegation. Effectively tasks subordinates and clearly delineates standards expected. Enhances performance through constructive supervision. Fosters motivation and enhances morale. Builds and sustains teams that successfully meet mission requirements. Encourages initiative and candor among subordinates.		Promotes creativity and energy among subordinates by striking the ideal balance of direction and delegation. Achieves highest levels of performance from subordinates by encouraging individual initiative. Engenders willing subordination, loyalty, and trust that allow subordinates to overcome their perceived limitations. Personal leadership fosters highest levels of motivation and morale, ensuring mission accomplishment even in the most difficult circumstances.		N/O

A	B	C	D	E	F	G	H
☐	☐	☐	☐	☐	☐	☐	☐

2. DEVELOPING SUBORDINATES. Commitment to train, educate, and challenge all Marines regardless of race, religion, ethnic background, or gender. Mentorship. Cultivating professional and personal development of subordinates. Developing team players and esprit de corps. Ability to combine teaching and coaching. Creating an atmosphere tolerant of mistakes in the course of learning.

ADV	Maintains an environment that allows personal and professional development. Ensures subordinates participate in all mandated development programs.		Develops and institutes innovative programs, to include PME, that emphasize personal and professional development of subordinates. Challenges subordinates to exceed their perceived potential thereby enhancing unit morale and effectiveness. Creates an environment where all Marines are confident to learn through trial and error. As a mentor, prepares subordinates for increased responsibilities and duties.		Widely recognized and emulated as a teacher, coach and leader. Any Marine would desire to serve with this Marine because they know they will grow personally and professionally. Subordinate and unit performance far surpassed expected results due to MRO's mentorship and team building talents. Attitude toward subordinate development is infectious, extending beyond the unit.		N/O

A	B	C	D	E	F	G	H
☐	☐	☐	☐	☐	☐	☐	☐

3. SETTING THE EXAMPLE. The most visible facet of leadership: how well a Marine serves as a role model for all others. Personal action demonstrates the highest standards of conduct, ethical behavior, fitness, and appearance. Bearing, demeanor, and self-discipline are elements.

ADV	Maintains Marine Corps standards for appearance, weight, and uniform wear. Sustains required level of physical fitness. Adheres to the tenets of the Marine Corps core values.		Personal conduct on and off duty reflects highest Marine Corps standards of integrity, bearing and appearance. Character is exceptional. Actively seeks self-improvement in wide-ranging areas. Dedication to duty and professional example encourage others' self-improvement efforts.		Model Marine, frequently emulated. Exemplary conduct, behavior, and actions are tone-setting. An inspiration to subordinates, peers, and seniors. Remarkable dedication to improving self and others.		N/O

A	B	C	D	E	F	G	H
☐	☐	☐	☐	☐	☐	☐	☐

4. ENSURING WELL-BEING OF SUBORDINATES. Genuine interest in the well-being of Marines. Efforts enhance subordinates' ability to concentrate/focus on unit mission accomplishment. Concern for family readiness is inherent. The importance placed on welfare of subordinates is based on the belief that Marines take care of their own.

ADV	Deals confidently with issues pertinent to subordinate welfare and recognizes suitable courses of action that support subordinates' well-being. Applies available resources, allowing subordinates to effectively concentrate on the mission.		Instills and/or reinforces a sense of responsibility among junior Marines for themselves and their subordinates. Actively fosters the development of and uses support systems for subordinates which improve their ability to contribute to unit mission accomplishment. Efforts to enhance subordinate welfare improve the unit's ability to accomplish its mission.		Noticeably enhances subordinates well-being, resulting in a measurable increase in unit effectiveness. Maximizes unit and base resources to provide subordinates with the best support available. Proactive approach serves to energize unit members to "take care of their own," thereby correcting potential problems before they can hinder subordinates' effectiveness. Widely recognized for techniques and policies that produce results and build morale. Builds strong family atmosphere. Puts motto *Mission first, Marines always*, into action.		N/O

A	B	C	D	E	F	G	H
☐	☐	☐	☐	☐	☐	☐	☐

5. COMMUNICATION SKILLS. The efficient transmission and receipt of thoughts and ideas that enable and enhance leadership. Equal importance given to listening, speaking, writing, and critical reading skills. Interactive, allowing one to perceive problems and situations, provide concise guidance, and express complex ideas in a form easily understood by everyone. Allows subordinates to ask questions, raise issues and concerns and venture opinions. Contributes to a leader's ability to motivate as well as counsel.

ADV	Skilled in receiving and conveying information. Communicates effectively in performance of duties.		Clearly articulates thoughts and ideas, verbally and in writing. Communication in all forms is accurate, intelligent, concise, and timely. Communicates with clarity and verve, ensuring understanding of intent or purpose. Encourages and considers the contributions of others.		Highly developed facility in verbal communication. Adept in composing written documents of the highest quality. Combines presence and verbal skills which engender confidence and achieve understanding irrespective of the setting, situation, or size of the group addressed. Displays an intuitive sense of when and how to listen.		N/O

A	B	C	D	E	F	G	H
☐	☐	☐	☐	☐	☐	☐	☐

JUSTIFICATION:

1. Marine Reported On: a. Last Name	b. First Name	c. MI	d. SSN	2. Occasion and Period Covered: a. OCC	b. From	To

G. INTELLECT AND WISDOM

1.PROFESSIONAL MILITARY EDUCATION (PME). Commitment to intellectual growth in ways beneficial to the Marine Corps. Increases the breadth and depth of warfighting and leadership aptitude. Resources include resident schools; professional qualifications and certification processes; nonresident and other extension courses; civilian educational institution coursework; a personal reading program that includes (but is not limited to) selections from the Commandant's Reading List; participation in discussion groups and military societies; and involvement in learning through new technologies.

ADV							N/O
	Maintains currency in required military skills and related developments. Has completed or is enrolled in appropriate level of PME for grade and level of experience. Recognizes and understands new and creative approaches to service issues. Remains abreast of contemporary concepts and issues.		PME outlook extends beyond MOS and required education. Develops and follows a comprehensive personal program which includes broadened professional reading and/or academic course work; advances new concepts and ideas.		Dedicated to life-long learning. As a result of active and continuous efforts, widely recognized as an intellectual leader in professionally related topics. Makes time for study and takes advantage of all resources and programs. Introduces new and creative approaches to services issues. Engages in a broad spectrum of forums and dialogues.		

A	B	C	D	E	F	G	H
☐	☐	☐	☐	☐	☐	☐	☐

2. DECISION MAKING ABILITY. Viable and timely problem solution. Contributing elements are judgment and decisiveness. Decisions reflect the balance between an optimal solution and a satisfactory, workable solution that generates tempo. Decisions are made within the context of the commander's established intent and the goal of mission accomplishment. Anticipation, mental agility, intuition, and success are inherent.

ADV							N/O
	Makes sound decisions leading to mission accomplishment. Actively collects and evaluates information and weighs alternatives to achieve timely results. Confidently approaches problems; accepts responsibility for outcomes.		Demonstrates mental agility; effectively prioritizes and solves multiple complex problems. Analytical abilities enhanced by experience, education, and intuition. Anticipates problems and implements viable, long-term solutions. Steadfast, willing to make difficult decisions.		Widely recognized and sought after to resolve the most critical, complex problems. Seldom matched analytical and intuitive abilities; accurately foresees unexpected problems and arrives at well-timed decisions despite fog and friction. Completely confident approach to all problems. Masterfully strikes a balance between the desire for perfect knowledge and greater tempo.		

A	B	C	D	E	F	G	H
☐	☐	☐	☐	☐	☐	☐	☐

3. JUDGMENT. The discretionary aspect of decision making. Draws on core values, knowledge, and personal experience to make wise choices. Comprehends the consequences of contemplated courses of action.

ADV							N/O
	Majority of judgments are measured, circumspect, relevant and correct.		Decisions are consistent and uniformly correct, tempered by consideration of their consequences. Able to identify, isolate and assess relevant factors in the decision making process. Opinions sought by others. Subordinates personal interest in favor of impartiality.		Decisions reflect exceptional insight and wisdom beyond this Marine's experience. Counsel sought by all; often an arbiter. Consistent, superior judgment inspires the confidence of seniors.		

A	B	C	D	E	F	G	H
☐	☐	☐	☐	☐	☐	☐	☐

JUSTIFICATION:

H. FULFILLMENT OF EVALUATION RESPONSIBILITIES

1. EVALUATIONS. The extent to which this officer serving as a reporting official conducted, or required others to conduct, accurate, uninflated, and timely evaluations.

ADV							N/O
	Occasionally submitted untimely or administratively incorrect evaluations. As RS, submitted one or more reports that contained inflated markings. As RO, concurred with one or more reports from subordinates that were returned by HQMC for inflated marking.		Prepared uninflated evaluations which were consistently submitted on time. Evaluations accurately described performance and character. Evaluations contained no inflated markings. No reports returned by RO or HQMC for inflated marking. No subordinates' reports returned by HQMC for inflated marking. Few, if any, reports were returned by RO or HQMC for administrative errors. Section Cs were void of superlatives. Justifications were specific, verifiable, substantive, and where possible, quantifiable and supported the markings given.		No reports submitted late. No reports returned by either RO or HQMC for administrative correction or inflated markings. No subordinates' reports returned by HQMC for administrative correction or inflated markings. Returned procedurally or administratively incorrect reports to subordinates for correction. As RO nonconcurred with all inflated reports.		

A	B	C	D	E	F	G	H
☐	☐	☐	☐	☐	☐	☐	☐

JUSTIFICATION:

1. Marine Reported On: a. Last Name	b. First Name	c. MI	d. SSN	2. Occasion and Period Covered: a. OCC	b. From	To

I. DIRECTED AND ADDITIONAL COMMENTS

J. CERTIFICATION

1. I CERTIFY that to the best of my knowledge and belief all entries made hereon are true and without prejudice or partiality and that I have provided a signed copy of this report to the Marine Reported on.

(Signature of Reporting Senior) (Date in YYYYMMDD format)

2. I ACKNOWLEDGE the adverse nature of this report and

☐ I have no statement to make

☐ I have attached a statement

(Signature of Marine Reported On) (Date in YYYYMMDD format)

K. REVIEWING OFFICER COMMENTS

1. OBSERVATION: ☐ Sufficient ☐ Insufficient

2. EVALUATION: ☐ Concur ☐ Do Not Concur

3. COMPARATIVE ASSESSMENT: Provide a comparative assessment of potential by placing an "X" in the appropriate box. In marking the comparison, consider all Marines of this grade whose professional abilities are known to you personally.

DESCRIPTION		COMPARATIVE ASSESSMENT
THE EMINENTLY QUALIFIED MARINE	☐	
ONE OF THE FEW EXCEPTIONALLY QUALIFIED MARINES	☐	
ONE OF THE MANY HIGHLY QUALIFIED PROFESSIONALS WHO FORM THE MAJORITY OF THIS GRADE	☐	
A QUALIFIED MARINE	☐	
UNSATISFACTORY	☐	

4. REVIEWING OFFICER COMMENTS: Amplify your comparative assessment mark; evaluate potential for continued professional development to include: promotion, command, assignment, resident PME, and retention; and put Reporting Senior marks and comments in perspective.

5. I CERTIFY that to the best of my knowledge and belief all entries made hereon are true and without prejudice or partiality.

(Signature of Reviewing Officer) (Date in YYYYMMDD format)

6. I ACKNOWLEDGE the adverse nature of this report and

☐ I have no statement to make

☐ I have attached a statement

(Signature of Marine Reported On) (Date in YYYYMMDD format)

L. ADDENDUM PAGE

ADDENDUM PAGE ATTACHED: ☐ YES

USMC FITNESS REPORT
NAVMC 11297 (Rev. 4-03) (P

ADDENDUM PAGE

DO NOT STAPLE THIS FORM

A. PURPOSE

1. Marine Reported On: a. Last Name	b. First Name	c. M.I	d. SSN	e. Grade	2. Occasion and Period Covered: a. OCC	b. From	To

3. Purpose:

a. Continuation of Comments Justification	Section I	RO	b. Accelerated Promotion Justification	c. Adverse Report MRO Statement	3rd Officer Sighter	d. Admin Review	e. Supplemental Material	f. HQMC Use
☐	☐	☐	☐	☐	☐	☐	☐	☐

B. TEXT

C. SUBMITTED BY

1. a. Last Name	b. First Name	c. MI	2. SSN	3. Service	4. Grade

Signature

☐☐☐☐ ☐☐ ☐☐
(Date in YYYYMMDD format)

D. GENERAL/SENIOR OFFICER ADVERSE REPORT SIGHTING

1. a. Last Name	b. First Name	c. MI	2. SSN	3. Service	4. Grade

5. Title

Signature

☐☐☐☐ ☐☐ ☐☐
(Date in YYYYMMDD format)

PAGE ☐ OF ☐

APPENDIX B. MASTER BRIEF SHEET

MASTER BRIEF SHEET

CREATED: 26 APR 2005

******* ADMINISTRATIVE INFORMATION (ORIGINATES FROM MCTFS - CONTACT YOUR ADMIN SECTION FOR CORRECTIONS) *******

NAME	SSN	GRADE	RANK	LCN	DOR	TIG	CURRENT DUTY ASSIGNMENT	BILLET DESCRIPTION	DCTB
MARINE, JOHN S.	123456789	O4	MAJ	12345678	19990501	5yr. 11mo.	US Central Command	J-3 Future Ops Officer	20030717

KEY DATE SUMMARY

DEAF	19890702
TIS	15yr. 11mo.
PEBD	19890520
AFADBD	19890520
OSCD	19950115
ACC COMM	19890520
DOR COMM	19890531
DOR LDO	
DSG PILOT	
DCADB	19890520
EAS	

AWARDS

MM	1		
NC	2		
NA	1		

MILITARY OCCUPATIONAL SPECIALTIES

PMOS	0302	Infantry Officer	AMOS4		
AMOS1	0602	Communications Officer	ACQ		
AMOS2			JOINT		
AMOS3			BMOS	9910	Unrestricted Officer

TRAINING SUMMARY

RIFLE	E/340	19980915	
PISTOL	M/340	19980915	
PFT	A/289	20030922	
MCMAP	TAN	20030815	

LANGUAGES

1994	French
1990	Spanish

EDUCATION SUMMARY

CIVILIAN		MILITARY		PME	
1990	BA, Biology	1993	Winter Mountain Leader	2002	Command & Staff Non-Res
1986	Associates Deg	1993	Summer Mountain Leader	1997	AWS Ph II
1982	HS	1987	Airborne	1995	AWS Ph I
		1990	Assault Climbers	1994	Warfighting Skills Prog
		1990	Infantry Officer (TBS)		
		1989	Basic School		

******* PERFORMANCE EVALUATION SUMMARY *******

ADMINISTRATIVE SUMMARY						REPORTING SENIOR MARKINGS														REVIEWING OFFICER MARKINGS								
Grade	OCC	From	Months		Billet Description	Reporting Senior		Per	Pro	Cou	Eff	Ini	Lea	Dev	Set	Ens	Co	PME	Dec	Jud	Eval	Reviewing Officer		RO marks - same grade at processing						
BMOS	Type	To	Com	Adv	Command	Promote	Reports		RPT Avg		RS Avg		Rs High		RPT at High		RV at Proc		Cum RV			Obser	Concur	RO marks - same grade cumulative						
Capt	GC	19980801	9		Company Commander	LtCol Amaknife		C	C	B	B	C	C	B	C	C	B	B	B	C	H	Col Curly		0/1	0/2	1/3	3/4	2/5	1/6	0/7	0/8
0302	N	19990503	X		1st Battalion 2d Marines	Yes	14 of 17		2.53		2.25		2.82		1		94.60		96.00			Suff	Yes	0/1	0/2	9/3	12/4	23/5	11/6	3/7	0/8
Maj	AN	19990504	3		Operations Officer	LtCol Butcher		C	C	C	H	C	C	H	C	H	B	H	C	C	H	Col Curly		0/1	0/2	1/3	2/4	2/5	2/6	0/7	0/8
0302	N	19990801		X	1st Battalion 2d Marines	Yes	8 of 8		2.88		2.93		3.50		1		89.76		89.76			Suff	Yes	0/1	1/2	2/3	7/4	7/5	5/6	0/7	0/8
Maj	CH	19990801	6		Operations Officer	LtCol Inflated		D	F	E	C	E	E	D	D	D	D	D	E	E	H	Col Moe		0/1	0/2	1/3	3/4	2/5	1/6	0/7	0/8
0302	N	20000119			1st Battalion 2d Marines	Yes	11 of 16		4.46		5.95		6.38		2		83.70		81.89			Suff	No	1/1	1/2	2/3	4/4	17/5	12/6	7/7	1/8
Maj	TR	20000120	3		BN Executive Officer	LtCol Solo		B	B	C	B	B	C	B	B	C	B	B	C	B	H	Col Moe		0/1	1/2	1/3	3/4	2/5	1/6	0/7	0/8
0302	N	20000414			1st Battalion 2d Marines	Yes	1 of 1		2.30		2.30		2.30		1		N/A		N/A			Suff	Yes	1/1	1/2	2/3	4/4	17/5	12/6	7/7	1/8
Maj	CH	20000415	12		Commanding Officer	Col Amaker		F	F	F	F	E	F	E	E	E	E	D	D	E	E	BGen Joe		1/1	0/2	3/3	3/4	18/5	20/6	12/7	0/8
9910	N	20010507	X		MCRS Pittsburg	Yes	21 of 21		5.29		5.12		5.57		1		93.68		93.68			Suff	Yes	2/1	0/2	5/3	7/4	24/5	26/6	16/7	1/8
Maj	CH	20010508	14		Commanding Officer	Col Tellall		F	E	E	E	E	F	E	E	E	E	E	E	E	E	BGen Mooney		0/1	1/2	0/3	7/4	38/5	17/6	4/7	0/8
9910	N	20020702			MCRS Pittsburg	Yes	5 of 8		5.14		5.33		5.86		1		83.87		86.44			Suff	No	0/1	1/2	0/3	9/4	46/5	19/6	5/7	1/8
Maj	TR	20020703	12		Commanding Officer	Col Gofigure		C	D	D	D	D	C	D	D	C	D	D	D	D	D	BGen Panzer									
9910	N	20030630	X		MCRS Pittsburg	Yes	7 of 12		3.79		4.42		5.00		1		83.67		80.00			Insuff									

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APPENDIX C. MODIFIED MODEL RESULTS

	Model #1	Model #1	Modified Model 1	Modified Model 1
	Sample=All PMOS	Sample=GA	Sample=99 & 00 All PMOS	Sample=99 & 00 GA
Acad rank%	0.00776	0.01014	0.00763	0.01005
	(0.00252)***	(0.00273)***	(0.00252)***	(0.00272)***
Ldrshp rank%	0.04544	0.04721	0.04570	0.04753
	(0.00239)***	(0.00260)***	(0.00239)***	(0.00260)***
Milskil Rank%	-0.00012	-0.00028	-0.00019	-0.00031
	(0.00262)	(0.00286)	(0.00262)	(0.00285)
Non top 3 MOS	-0.07889	-0.22319	-0.06141	-0.22338
	(0.12689)	(0.13175)*	(0.12693)	(0.13182)*
Female	1.24994	1.17002	1.24718	1.17931
	(0.20288)***	(0.21007)***	(0.20294)***	(0.20990)***
OCC	0.29759	0.51906	0.30324	0.51162
	(0.15969)*	(0.17646)***	(0.16187)*	(0.17965)***
NROTC	0.42165	0.39534	0.42269	0.39419
	(0.18365)**	(0.19964)**	(0.18396)**	(0.19990)**
MECEP	0.85537	1.03238	0.88042	1.05361
	(0.24385)***	(0.26172)***	(0.24383)***	(0.26175)***
ECP	0.57056	0.73591	0.60245	0.75273
	(0.32472)*	(0.33828)**	(0.32495)*	(0.33851)**
USNA	0.52298	0.67385	0.54117	0.70367
	(0.20323)**	(0.22584)***	(0.20353)***	(0.22616)***
MCP	0.74733	0.85646	0.77828	0.81174
	(0.43663)*	(0.45156)*	(0.43864)*	(0.45411)*
Age	-0.01857	-0.03330	-0.02445	-0.03782
	(0.02861)	(0.03070)	(0.02868)	(0.03074)
Black	-0.66514	-0.78005	-0.64349	-0.76278
	(0.23719)***	(0.24596)***	(0.23700)***	(0.24559)***
Other race	0.04979	0.02236	0.10345	0.08161
	(0.33052)	(0.34019)	(0.33045)	(0.33990)
Married	0.81581	0.87201	0.81490	0.87377
	(0.16240)***	(0.17537)***	(0.16221)***	(0.17508)***
Divorced	0.81495	0.69361	0.83647	0.73987
	(0.43337)*	(0.46208)	(0.43315)*	(0.46166)
Widowed	1.28763	1.17487		
	(3.87895)	(3.85326)		
TBS FY 98			-0.69768	-0.44125
			(1.12681)	(1.16897)
TBS FY 99			-0.31524	-0.23229
			(0.16544)*	(0.18349)
TBS FY 00			0.00000	0.00000
			(0.00000)	(0.00000)
TBS FY 01			-0.06322	-0.19362
			(0.16451)	(0.18106)
TBS FY 03			-0.16949	-0.19514
			(0.18142)	(0.19432)
TBS FY 04			-0.89105	-1.06329
			(0.23003)***	(0.23838)***
TBS FY 05			-0.21254	-0.79871
			(0.61043)	(0.75190)
Constant	-2.70205	-2.46893	-2.37168	-2.12556
	(0.68893)***	(0.73991)***	(0.70862)***	(0.76083)***
Observations	4757	3957	4757	3957
R-squared	0.15	0.17	0.15	0.18
Standard errors in parentheses	F(15,4739)=49.15 Prob>F=0.0000	F(17,3939)=48.58 Prob>F=0.0000	F(22,4734)=38.90 Prob>F=0.0000	F(22,3934)=38.66 Prob>F=0.0000
* significant at 10%	** significant at 5%	*** significant at 1%		

	Model #2	Model #2	Modified Model 2	Modified Model 2
	Sample=All PMOS	Sample=GA	Sample=99 & 00 All PMOS	Sample=99 & 00 GA
Acad rank%	0.00815	0.01047	0.00802	0.01038
	(0.00251)***	(0.00272)***	(0.00251)***	(0.00272)***
Ldrshp rank%	0.04555	0.04707	0.04581	0.04741
	(0.00238)***	(0.00260)***	(0.00238)***	(0.00259)***
Milskil rank%	0.00014	-0.00008	0.00006	-0.00009
	(0.00262)	(0.00285)	(0.00262)	(0.00285)
Non top 3 MOS	-0.08767	-0.23675	-0.07141	-0.24081
	(0.12688)	(0.13176)*	(0.12693)	(0.13181)*
Female	1.32633	1.25367	1.32495	1.26627
	(0.20123)***	(0.20819)***	(0.20134)***	(0.20806)***
Pri Enl Mar	0.54973	0.56859	0.57578	0.58914
	(0.19544)***	(0.20796)***	(0.19548)***	(0.20792)***
Age	-0.02302	-0.02172	-0.02961	-0.02907
	(0.02523)	(0.02718)	(0.02533)	(0.02727)
Black	-0.65832	-0.78439	-0.63790	-0.77014
	(0.23689)***	(0.24576)***	(0.23669)***	(0.24537)***
Other race	0.03761	0.01794	0.08875	0.07052
	(0.33041)	(0.34012)	(0.33037)	(0.33986)
Married	0.78560	0.82171	0.78364	0.82260
	(0.16138)***	(0.17440)***	(0.16120)***	(0.17412)***
Divorced	0.80336	0.67156	0.82073	0.71530
	(0.43157)*	(0.46037)	(0.43133)*	(0.45994)
Widowed	1.38199	1.27855		
	(3.88095)	(3.85776)		
TBS FY 98			-0.68271	-0.42987
			(1.12727)	(1.17027)
TBS FY 99			-0.32678	-0.22973
			(0.16477)**	(0.18263)
TBS FY 00			0.00000	0.00000
			(0.00000)	(0.00000)
TBS FY 01			-0.07239	-0.20200
			(0.16425)	(0.18075)
TBS FY 03			-0.22864	-0.28697
			(0.18016)	(0.19258)
TBS FY 04			-0.88804	-1.06464
			(0.22999)***	(0.23843)***
TBS FY 05			-0.26053	-0.80000
			(0.60977)	(0.75208)
Constant	-2.38056	-2.41658	-2.01167	-1.98442
	(0.62505)***	(0.67354)***	(0.64451)***	(0.69468)***
Observations	4757	3957	4757	3957
R-squared	0.15	0.17	0.15	0.17
Standard errors in parentheses	F(12,4744)=68.70 Prob>F=0.0000	F(12,3944)=67.45 Prob>F=0.0000	F(17,4739)=49.66 Prob>F=0.0000	F(17,3939)=49.05 Prob>F=0.0000
*significant at 10%	** significant at 5%	*** significant at 1%		

	Model #3	Model #3	Modified Model 3	Modified Model 3
	Sample=All PMOS	Sample=GA	Sample=99 & 00 All PMOS	Sample=99 & 00 GA
Top Third	1.03089	1.17918	1.03230	1.17624
	(0.12577)***	(0.14044)***	(0.12569)***	(0.14007)***
Bottom Third	-1.76535	-1.86051	-1.76423	-1.86416
	(0.12424)***	(0.13546)***	(0.12417)***	(0.13512)***
Non top3 MOS	0.07103	-0.20871	0.03305	-0.45292
	(0.10328)	(0.11035)*	(0.11429)	(0.12971)***
Female	0.94843	0.84139	0.94624	0.85928
	(0.18041)***	(0.18824)***	(0.18053)***	(0.18791)***
OCC	0.25659	0.42092	0.26598	0.40102
	(0.14169)*	(0.15761)***	(0.14322)*	(0.15966)**
NROTC	0.53681	0.53675	0.53626	0.52219
	(0.16254)***	(0.17814)***	(0.16277)***	(0.17813)***
MECEP	1.30105	1.38225	1.32210	1.38527
	(0.21675)***	(0.23434)***	(0.21672)***	(0.23409)***
ECP	0.58335	0.63257	0.60499	0.60949
	(0.28606)**	(0.29948)**	(0.28625)**	(0.29940)**
USNA	0.69162	0.83487	0.70240	0.84610
	(0.17960)***	(0.20220)***	(0.17987)***	(0.20220)***
MCP	1.22290	1.29948	1.25600	1.22133
	(0.38595)***	(0.40120)***	(0.38737)***	(0.40266)***
Age	-0.02859	-0.04176	-0.03278	-0.04308
	(0.02559)	(0.02758)	(0.02566)	(0.02758)
Black	-0.65029	-0.74470	-0.62455	-0.70903
	(0.21245)***	(0.22149)***	(0.21239)***	(0.22100)***
Other race	-0.09482	-0.16371	-0.05236	-0.10881
	(0.29230)	(0.30389)	(0.29224)	(0.30328)
Married	0.81578	0.88763	0.81488	0.88780
	(0.14246)***	(0.15541)***	(0.14233)***	(0.15501)***
Divorced	0.97101	0.81807	0.97859	0.80094
	(0.37605)***	(0.39946)**	(0.37598)***	(0.39889)**
Widowed	1.15430	0.95048		
	(3.86232)	(3.84943)		
TBS FY 98			-0.93124	-0.55234
			(1.12098)	(1.16587)
TBS FY 99			-0.34502	-0.22665
			(0.16457)**	(0.18290)
TBS FY 00			-0.05504	0.33905
			(0.17412)	(0.19986)*
TBS FY 01			-0.04334	-0.13936
			(0.16380)	(0.18065)
TBS FY 03			-0.12265	-0.20280
			(0.18026)	(0.19337)
TBS FY 04			-0.85054	-1.05882
			(0.22889)***	(0.23782)***
TBS FY 05			-0.31593	-1.01500
			(0.60801)	(0.75069)
Constant	0.42732	0.96256	0.70268	1.24026
	(0.60956)	(0.65826)	(0.62926)	(0.67814)*
Observations	5976	4929	5976	4929
R-squared	0.12	0.14	0.12	0.15
Standard errors in parentheses	F(16,5959)=51.42 Prob>F=0.0000	F(16,4912)=50.81 Prob>F=0.0000	F(22,5953)=38.37 Prob>F=0.0000	F(22,4906)=38.77 Prob>F=0.0000
*significant at 10%	** significant at 5%	*** significant at 1%		

	Model #4	Model #4	Modified Model 4	Modified Model 4
	Sample=All PMOS	Sample=GA	Sample=99 & 00 All PMOS	Sample=99 & 00 GA
Top Third	1.08193	1.22508	1.08367	1.22341
	(0.12532)***	(0.14003)***	(0.12524)***	(0.13967)***
Bottom Third	-1.78932	-1.87680	-1.78660	-1.88059
	(0.12410)***	(0.13526)***	(0.12403)***	(0.13494)***
Non top 3 MOS	0.05823	-0.22490	0.01549	-0.47593
	(0.10338)	(0.11051)**	(0.11438)	(0.12986)***
Female	1.05351	0.96040	1.05166	0.97772
	(0.17934)***	(0.18695)***	(0.17947)***	(0.18663)***
Pri Enl Marin	0.89430	0.84324	0.91299	0.84574
	(0.17206)***	(0.18397)***	(0.17208)***	(0.18372)***
Age	-0.04822	-0.04991	-0.05252	-0.05403
	(0.02264)**	(0.02448)**	(0.02272)**	(0.02452)**
Race	-0.62234	-0.71970	-0.59699	-0.68546
	(0.21246)***	(0.22157)***	(0.21239)***	(0.22106)***
Race	-0.12342	-0.18816	-0.08179	-0.13748
	(0.29238)	(0.30397)	(0.29234)	(0.30340)
Married	0.80597	0.86276	0.80428	0.86377
	(0.14186)***	(0.15490)***	(0.14173)***	(0.15449)***
Divorced	1.00611	0.83920	1.01009	0.82503
	(0.37484)***	(0.39835)**	(0.37473)***	(0.39771)**
Widowed	1.28784	1.08769		
	(3.86875)	(3.85802)		
TBS FY 98			-0.92533	-0.55401
			(1.12280)	(1.16841)
TBS FY 99			-0.37213	-0.24876
			(0.16423)**	(0.18246)
TBS FY 00			-0.07138	0.31561
			(0.17425)	(0.20010)
TBS FY 01			-0.06897	-0.17428
			(0.16380)	(0.18064)
TBS FY 03			-0.19668	-0.30285
			(0.17949)	(0.19224)
TBS FY 04			-0.85193	-1.06587
			(0.22916)***	(0.23817)***
TBS FY 05			-0.35882	-1.00701
			(0.60827)	(0.75179)
Constant	1.17153	1.51063	1.48051	1.88267
	(0.54406)**	(0.58966)**	(0.56387)***	(0.61022)***
Observations	5976	4929	5976	4929
R-squared	0.12	0.14	0.12	0.14
Standard errors in parentheses	F(11,5964)=72.25 Prob>F=0.0000	F(11,4917)=71.11 Prob>F=0.0000	F(17,5958)=47.99 Prob>F=0.0000	F(17,4911)=48.35 Prob>F=0.0000
* significant at 10%	** significant at 5%	*** significant at 1%		

	Model #5	Model #5	Modified Model 5	Modified Model 5
	Sample=All PMOS	Sample=GA	Sample=99 & 00 All PMOS	Sample=99 & 00 GA
TBS classrank	0.04416	0.04781	0.04414	0.04771
	(0.00186)***	(0.00201)***	(0.00186)***	(0.00200)***
Non top 3 MOS	0.12874	-0.14702	0.10411	-0.37094
	(0.10272)	(0.10950)	(0.11372)	(0.12880)***
Female	1.02700	0.93697	1.02372	0.95245
	(0.17934)***	(0.18685)***	(0.17946)***	(0.18657)***
OCC	0.24800	0.40689	0.25630	0.38567
	(0.14064)*	(0.15613)***	(0.14217)*	(0.15821)**
NROTC	0.47542	0.46540	0.47553	0.45324
	(0.16145)***	(0.17661)***	(0.16168)***	(0.17664)**
MECEP	1.07747	1.15658	1.09796	1.16068
	(0.21577)***	(0.23276)***	(0.21576)***	(0.23257)***
ECP	0.47133	0.51098	0.49462	0.49059
	(0.28413)*	(0.29690)*	(0.28432)*	(0.29688)*
USNA	0.62189	0.75451	0.63255	0.76564
	(0.17841)***	(0.20053)***	(0.17868)***	(0.20057)***
MCP	1.02697	1.10352	1.05891	1.02890
	(0.38373)***	(0.39813)***	(0.38516)***	(0.39968)**
Age	-0.02509	-0.03735	-0.02953	-0.03881
	(0.02541)	(0.02733)	(0.02548)	(0.02734)
Race	-0.51367	-0.60613	-0.49007	-0.57509
	(0.21147)**	(0.21997)***	(0.21141)**	(0.21952)***
Other race	-0.05129	-0.10607	-0.01062	-0.05441
	(0.29028)	(0.30126)	(0.29023)	(0.30073)
Married	0.77077	0.83511	0.77059	0.83630
	(0.14151)***	(0.15411)***	(0.14138)***	(0.15375)***
Divorced	0.87095	0.72296	0.87987	0.70764
	(0.37341)**	(0.39597)*	(0.37336)**	(0.39549)*
Widowed	1.40570	1.23484		
	(3.83533)	(3.81547)		
TBS FY 98			-1.15018	-0.75060
			(1.11315)	(1.15576)
TBS FY 99			-0.34283	-0.21738
			(0.16342)**	(0.18133)
TBS FY 00			-0.09720	0.29361
			(0.17295)	(0.19819)
TBS FY 01			-0.05331	-0.13754
			(0.16266)	(0.17910)
TBS FY 03			-0.14471	-0.21010
			(0.17898)	(0.19171)
TBS FY 04			-0.84772	-1.04269
			(0.22730)***	(0.23575)***
TBS FY 05			-0.23633	-0.87048
			(0.60365)	(0.74408)
Constant	-2.10124	-1.75057	-1.80979	-1.46990
	(0.60966)***	(0.65667)***	(0.62902)***	(0.67639)**
Observations	5976	4929	5976	4929
R-squared	0.13	0.16	0.14	0.16
Standard errors in parentheses	F(15,5960)=61.17 Prob>F=0.0000	F(15,4913)=60.97 Prob>F=0.0000	F(21,5954)=44.69 Prob>F=0.0000	F(21,4907)=45.34 Prob>F=0.0000
* significant at 10%	** significant at 5%	*** significant at 1%		

	Model #6	Model #6	Modified Model 6	Modified Model 6
	Sample=All PMOS	Sample=GA	Sample=99 & 00 All PMOS	Sample=99 & 00 GA
TBS classrank	0.04516	0.04864	0.04513	0.04857
	(0.00183)***	(0.00198)***	(0.00183)***	(0.00198)***
Non top 3 MOS	0.11911	-0.15997	0.09040	-0.39000
	(0.10278)	(0.10963)	(0.11377)	(0.12889)***
Female	1.12208	1.04447	1.11938	1.05985
	(0.17815)***	(0.18541)***	(0.17828)***	(0.18513)***
Pri Enl Mar	0.71093	0.66263	0.73008	0.66736
	(0.17138)***	(0.18284)***	(0.17141)***	(0.18263)***
Age	-0.04051	-0.04133	-0.04509	-0.04569
	(0.02249)*	(0.02427)*	(0.02256)**	(0.02431)*
Black	-0.48529	-0.58109	-0.46204	-0.55119
	(0.21135)**	(0.21991)***	(0.21127)**	(0.21943)**
Other race	-0.07333	-0.12257	-0.03358	-0.07529
	(0.29025)	(0.30120)	(0.29022)	(0.30070)
Married	0.75890	0.80945	0.75794	0.81155
	(0.14085)***	(0.15353)***	(0.14073)***	(0.15316)***
Divorced	0.89534	0.73531	0.90075	0.72299
	(0.37206)**	(0.39467)*	(0.37196)**	(0.39413)*
Widowed	1.53592	1.36881		
	(3.84001)	(3.82205)		
TBS FY 98			-1.14750	-0.75354
			(1.11444)	(1.15769)
TBS FY 99			-0.36429	-0.23312
			(0.16302)**	(0.18081)
TBS FY 00			-0.11138	0.27316
			(0.17301)	(0.19832)
TBS FY 01			-0.07456	-0.16663
			(0.16258)	(0.17900)
TBS FY 03			-0.21177	-0.30212
			(0.17813)	(0.19049)
TBS FY 04			-0.84872	-1.04925
			(0.22745)***	(0.23597)***
TBS FY 05			-0.27380	-0.85951
			(0.60363)	(0.74479)
Constant	-1.52387	-1.36422	-1.20062	-0.99239
	(0.55192)***	(0.59677)**	(0.57122)**	(0.61679)
Observations	5976	4929	5976	4929
R-squared	0.13	0.15	0.13	0.16
Standard errors in parentheses	F(10,5965)=89.53 Prob>F=0.0000	F(10,4918)=88.90 Prob>F=0.0000	F(16,5959)=57.25 Prob>F=0.0000	F(16,4912)=57.91 Prob>F=0.0000
* significant at 10%	** significant at 5%	*** significant at 1%		

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